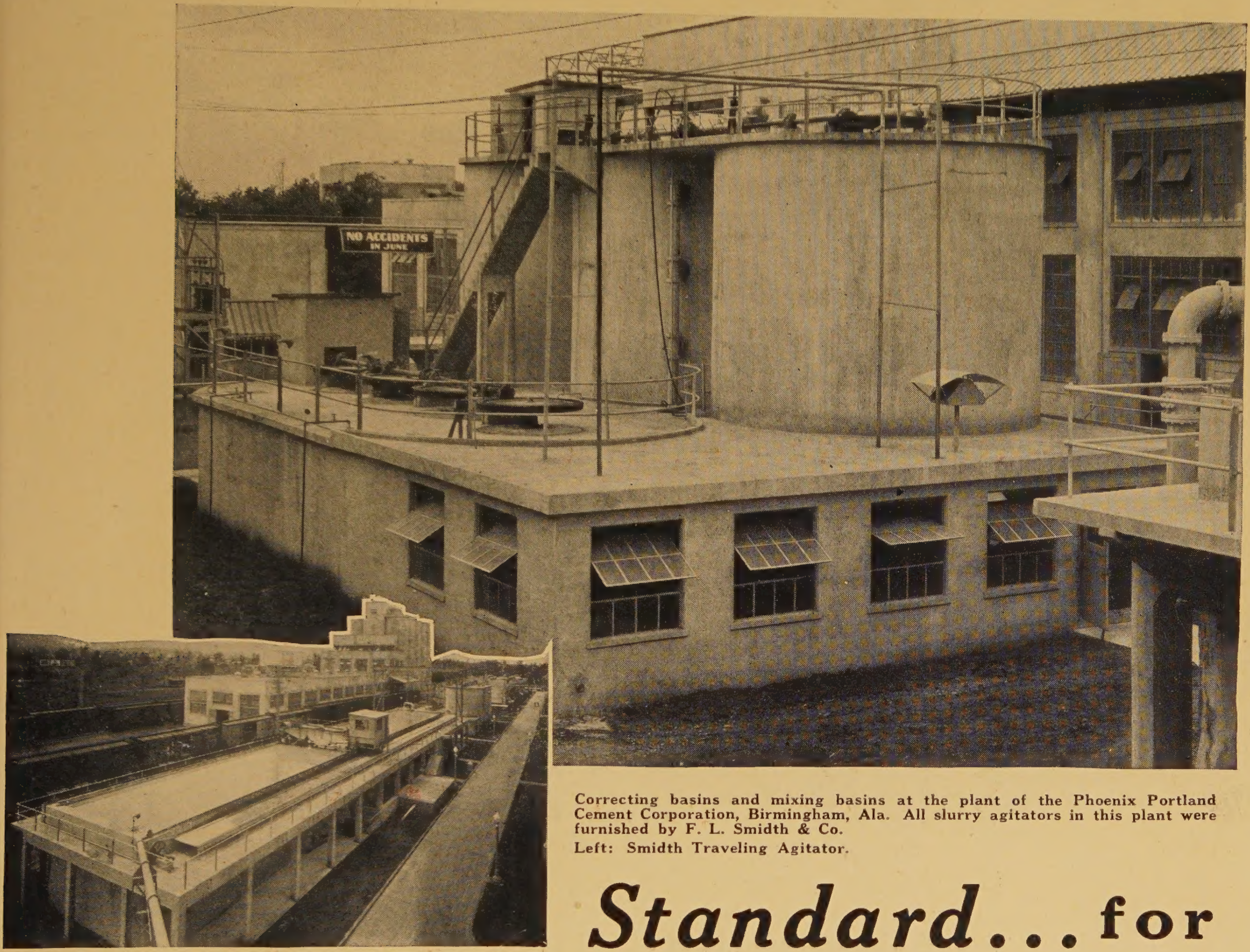
MILL SECTION of
Concrete



Correcting basins and mixing basins at the plant of the Phoenix Portland Cement Corporation, Birmingham, Ala. All slurry agitators in this plant were furnished by F. L. Smidth & Co.
Left: Smidth Traveling Agitator.

Standard... for the Agitation of Cement Slurry

THE standard agitators furnished by F. L. Smith & Co., Inc., New York, for the several basins at the Phoenix plant, combine mechanical agitation with air. On each of the stirring arms is mounted an air nozzle through which is supplied a quantity of air just sufficient to make the vertical mix. The stirring arms mechanically make the horizontal mix.

The photograph above shows the three correcting basins, each 20 ft. in diameter and 20 ft. high, and the mixing basin which has a capacity equal to all three correcting basins.

A unique feature of slurry handling at this plant is the 200 ft. storage basin equipped with the SMIDTH Traveling Agitator.

For More Than Forty-Five Years Builders of Slurry Agitating Equipment.

F. L. Smidth & Co., Inc.
ENGINEERS
Designers and Equippers of
Cement Making Factories

50 Church Street **NEW YORK**

Index to Advertisers on Page 91 of This Section

POLYSIUS

In Europe, Africa, The Far East, and now America, Polysius Cement Plant Equipment has been the accepted Standard.

Elaborate brochures illustrating Polysius Solo Mills Solo Kilns, and Zet Crushers in use all over the World, will be mailed upon request.

POLYSIUS CORPORATION
BETHLEHEM TRUST BLDG.
BETHLEHEM PA.

MILL SECTION of
Concrete

The Mill Edition of CONCRETE is edited for the manufacturers of portland cement, lime and similar products. Its pages are devoted to discussions of plant design, management, operation, production efficiency, chemical research and control, quarry operation, progress and news of the industry.

The Mill Edition also contains all the material published in the corresponding Regular Edition and so provides news of the uses and merchandising of the materials whose manufacture is discussed in the Mill Edition.

The Regular Section furnishes mill operating officials and mill executives valuable points of contact with the users of the materials they produce.

Volume 31 October, 1927 Number 4

CONTENTS

□ □ □

Florida Portland Cement Company Begins Operations—*(Illus.)* 93

This first article describing, in a general way, the new plant of the Florida Portland Cement Company at Tampa, Fla., will be followed by another article explaining in detail the operation of some of the most interesting features in the plant.

New Plant of the Dewey Portland Cement Company Has Interesting Features—*(Illus.)* 103

Gordon Smith completes his account of the construction of the new Dewey plant on the shore of the Mississippi, near Davenport.

Cement Cooling Equipment Installed at Bessemer Plant—*(Illus.)* 107

Experiments made at the Bessemer plant of the Bessemer Limestone and Cement Company resulted in the development of the new method of cooling cement as it leaves the compeb mills, described in this article.

Notes on the Use of Sandy Clay in Portland Cement Manufacture 109

Eduardo Taylor presents some interesting tests made on this subject at the Cebu Portland Cement Co. plant at Maya, P. I.

Work Begun on Power and Mechanical Exposition 109

New British Specifications for Portland Blast Furnace Cement—*(Illus.)* 110

Editorials 112

Supply and Demand
Dust
Accident Prevention

Men and Mills 113

Several pages of live news about cement plants and the men that operate them.

Cement Statistics for August 116

Mill Equipment 117

With the Manufacturers 118

REGULAR SECTION

The Future of Reinforced Concrete 21

F. R. McMillan, Director of Research, Portland Cement Association, analyzes the past, present and future of the industry in a paper presented at the Semi-Annual Meeting of the Concrete Reinforcing Steel Institute.

Copyright, 1927, Concrete Publishing Company

INDEX TO ADVERTISEMENTS

Allis-Chalmers Mfg. Co. 139
American Oil Corp. 136
Babcock & Wilcox Co. 133
Baker & Spencer, Inc. 140
Bates Valve Bag Co. 142
Bradley Pulverizer Co. 137
Burrell Engineering & Const. Co. 138
Caldwell, H. W., & Son 134
Coates Steel Products Co. 92
Cutler Hammer Mfg. Co., The 135
Du Pont de Nemours, E. I., Co., Inc. 132
Edge Moor Iron Co. 127
Engineering & Designing 140
Fuller Co., The 129
Green Firebrick Co., A. P. 126
Heine Boiler Co. 124
Hercules Powder Co., Inc. 120-121
Hunt, Robert W., Co. 86
Huron Industries, Inc. 123
James Mfg. Co., D. D. 119
Jones Foundry & Machine Co., W. A. 128
Jeffrey Mfg. Co., The 130
Keystone Driller Co. 138
Kritzer Co., The 140
Latimer, Robert, & Co. 141
Link-Belt Co. 125
Meade, Richard K., & Co. 140
Pennsylvania Crusher Co. 139
Polysius Corp. 90
Sargent, E. H., & Co. 137
Schaffer Poidometer Co. 136
Smidth, F. L., Co. 89
Sonntag, C. H. 140
Standard Oil Co. 131
Super Cement Co., The 88
Timken Roller Bearing Co., The 12
Webster Mfg. Co. 122
Wood's, T. B., Sons Co. 141

COATES GRINDING MEDIA

CARBEX FORGED STEEL BALLS

THESE balls are forged under controlled conditions from high chromium and carbon steel. They are tough, long wearing grinding bodies of guaranteed service. Right now we can quote very attractive prices on the following sizes—2½-inch, 3-inch, 4-inch, and 5-inch. Immediate shipments from stock.

"TUNGSCO" STEEL NUGGETS

Where grinding bodies are subjected to unusual service, we recommend these nuggets without qualification. They are made from high quality rolled steel by a special process which renders them durable, tough, and free from checking or breaking in any form.

They are made in two grades—"TUNGSCO" Chromium and "TUNGSCO" High Carbon—and can be shipped from stock in the following sizes—⅝x1¼-inch, ¾x¼ inch, ⅞x1¼-inch.

Write Us for Prices

Coates Steel Products Company
GREENVILLE, ILLINOIS

Largest Exclusive Manufacturers of Grinding Media

Florida Portland Cement Company Begins Operation

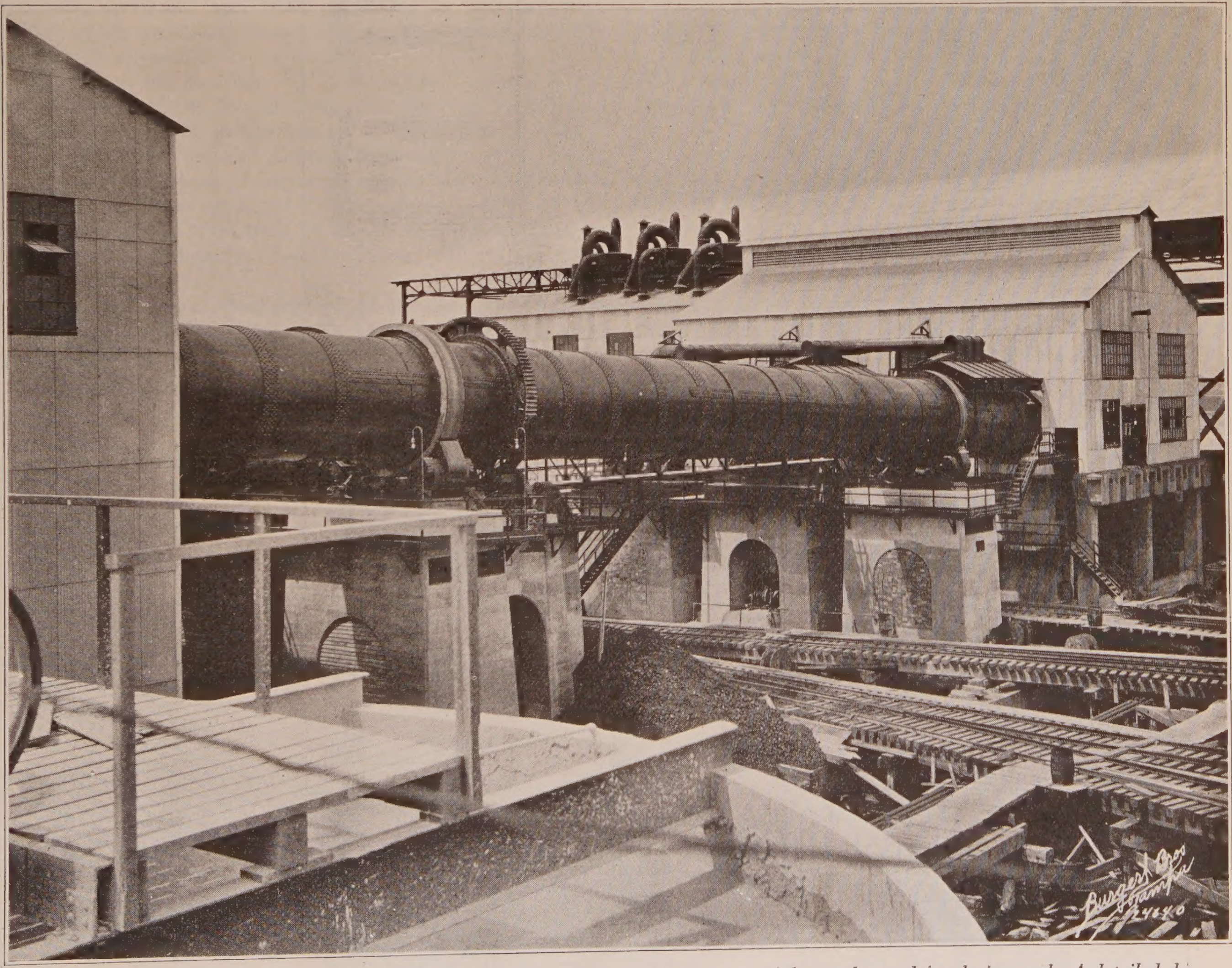
A Detailed Description of the Plant—Is Largest Manufacturing Plant in Florida—Economic Considerations—Search for Raw Materials—Main Features of Plant Layout — Methods of Handling Raw Materials — Kilns — Power Plant

Part I.

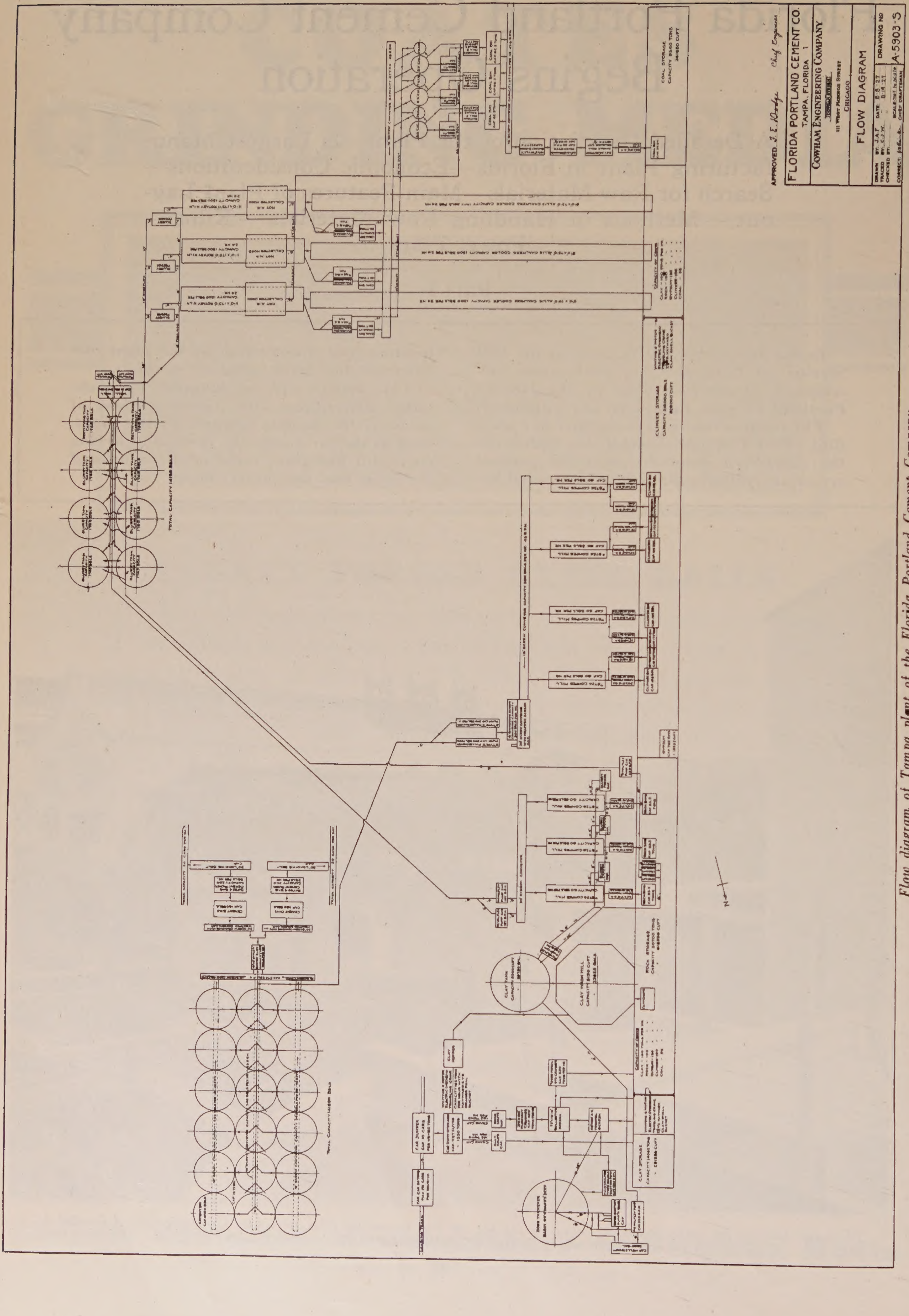
In the September, 1926, issue of the Mill Section of "Concrete," a preliminary description of the new plant of the Florida Portland Cement Company was published.

The plant is now completed and in operation. Part I of the detailed description of the completed plant discusses the general economic considerations that influenced the location and construction of the plant and describes the manufacturing methods.

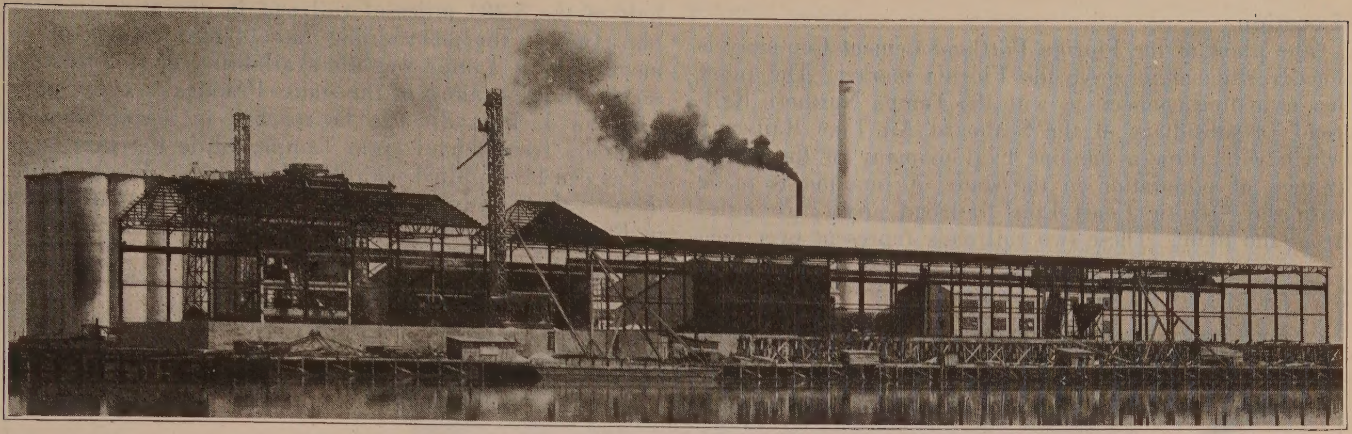
This article will be followed by a detailed description with operating data of some of the unique features of the plant, such as the car dump, the method of drying coal with hot gases collected from around the kilns and the power house.



The kilns, showing the apron feeder for collecting the hot air from around the kilns, to be used for drying coal. A detailed description of this equipment will be published in the next insallment



Flow diagram of Tampa plant of the Florida Portland Cement Company



A general view of the plant taken from Sparkmans Bay

TWENTY-FIVE years of experience in the design and operation of portland cement plants has found full expression in the new plant of the Florida Portland Cement Company now being brought into production at Tampa, Florida. The first kiln in this plant was started on September 5th.

A modern plant in every sense of the word—this new 1,500,000 barrel per year mill. It has involved many innovations in machinery and design to make it one of the most up-to-the-minute cement mills in this country. Yet, modernism is not the chief attribute of this plant. It has been designed and built primarily to provide, first, a high-grade portland cement and, second, to produce this cement as economically as possible.

More than the building of "just another" cement plant, the selection of the location and the decision to build is an interesting page in the history of the cement industry.

The Florida Portland Cement Company is the largest manufacturing plant of any kind in the state of Florida. The very decision to build this plant was based on the sound economics of Florida as a state of permanent prosperity and on the cement industry as a contributing factor to that prosperity.

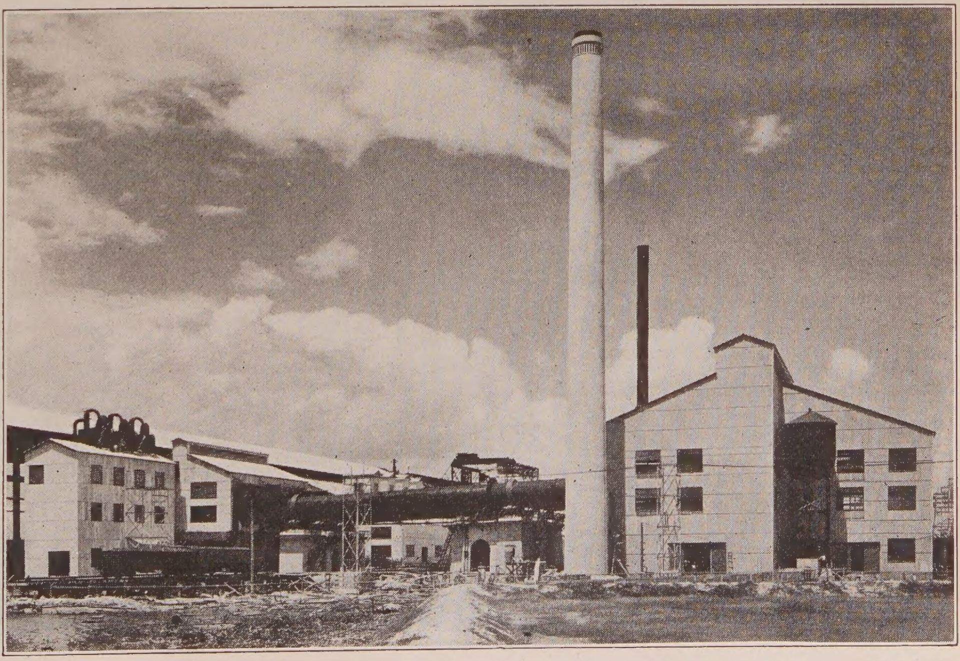
It is but natural that this plant should capitalize on its location in the naming of its product. A strong local pride exists throughout the state of Florida and to manufacture and sell "Florida" portland cement identifies this plant and its product with the industrial development that has been replacing the recent real estate boom.

Preliminary Investigations

For some time Florida was considered the last of the unexploited territories for a new cement plant development. As early as the winter of 1920-1921, a preliminary survey of Florida's cement raw materials was started. Samples of calcareous and argillaceous materials of all kinds were gathered and analyzed. Though a large variety of both classes was found, most of them were rejected for one reason or another.

Finally, deposits of limestone and clay near Brooksville (about 50 miles north of Tampa) were found satisfactory for the manufacture of a high-grade cement and in sufficient quantities to warrant exploitation. As a result, in the fall of 1925, the Florida Portland Cement Company was organized to develop these properties and to build a plant on Hooker's Point, Tampa.

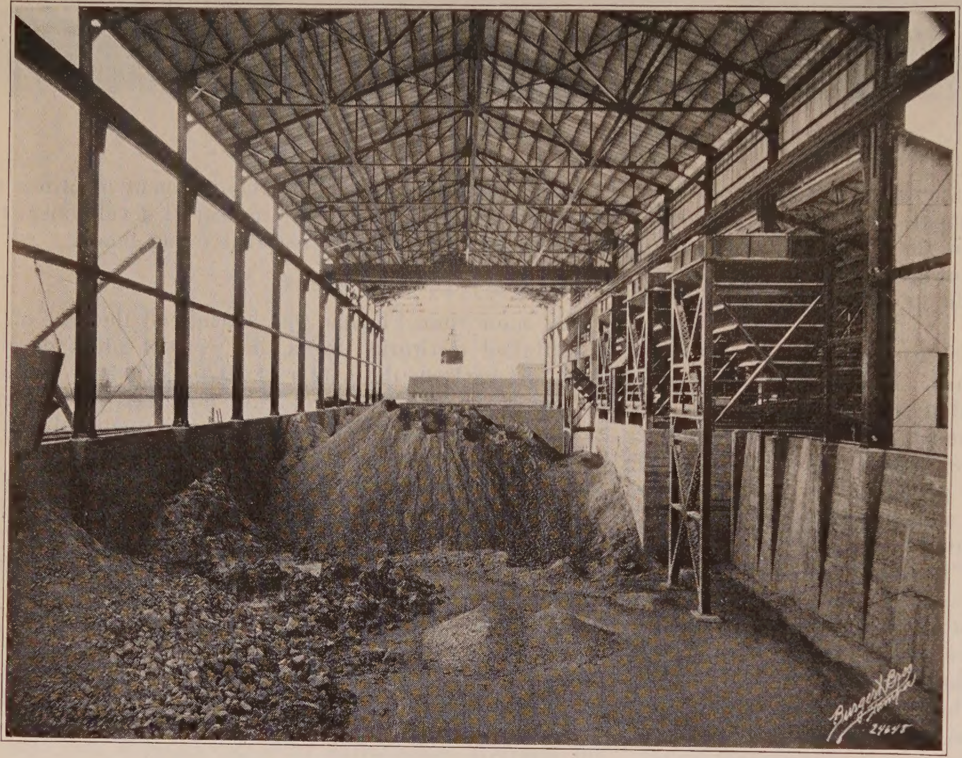
At that time, there were reported some 12 or 14 different interests endeavoring to locate suitable raw material deposits and to build the first plant in Florida. However, with the announcement of the formation of the Florida Portland Cement Company and with the "bursting of the real estate bubble," the other interests gradually withdrew.



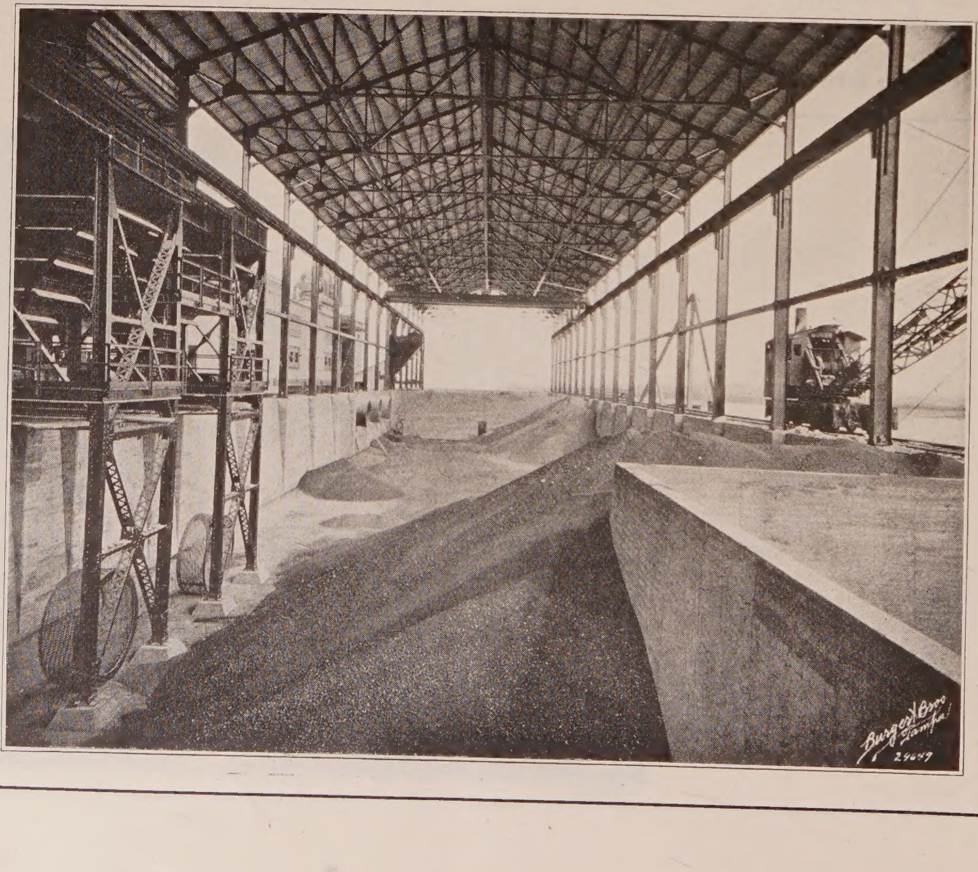
The kilns and power house. The latter has three waste heat boilers

Location

The plant of the Florida Portland Cement Company is ideally situated to serve the Florida market. The plant has switching connections with the Tampa Northern Railroad (a subsidiary of the Seaboard Air Line Railway) which will allow a one-line haul to many of the larger centers of population in the state. A junction is made with the Atlantic Coast Line Railroad about two miles from the plant. These two railroads represent over one-half of the 5,284 miles of railroad in operation in Florida. One of the determining factors in locating the cement plant at Tampa was the availability of this railroad service to all sections of the state. Practically every point south of Jacksonville can be reached in a minimum of 36 hours freight haul from Tampa, while the west coast towns can be supplied with 24-hour service. Furthermore, there is the possibility of deep water shipments to points in Florida and other southern cities and to the ports of



The north end of the materials storage building. To the right are the stone hoppers. Back of them is the clay chute



South end of materials storage building. In the background are the three coolers discharging into clinker storage

Central and South America. It seems likely, however, that the initial capacity of the Florida mill will be consumed within the state of Florida.

Raw Materials

The raw material deposits consist of 400 acres of limestone lands in Hernando County (48 miles north of Tampa). The limestone deposit was covered by a light overburden varying from one to three feet in depth. The initial opening consisted of clearing about 7 acres by means of a drag line with trucks and laborers to finish cleaning up. Quarry equipment consists of a Marion 61 steam shovel with a 2½-yard dipper on caterpillar traction and a Marion 32. At present the large shovel is working on a shelf about 15 feet below the surface of the rock loading to cars on a track about 7 feet above. The smaller shovel is working behind on a lower bench.

Standard gondolas are used to haul the raw material from the quarry to the plant. A 4-mile spur track connects the quarry with the main line of the Tampa Northern Railroad. The quarry is served by a 75-ton steam locomotive.

The clay deposits are located south of Brooksville and are traversed by the Tampa Northern Railroad. The clay is being excavated and loaded by a drag line directly into standard gondola cars. The clay deposits are served by a Plymouth 24-ton gasoline locomotive. At Brooksville, the trains of limestone and clay are assembled and hauled to the plant at Tampa. At the present time, shipments of about 24 cars of limestone and 6 cars of clay are being made daily.

The limestone deposits were thoroughly core-drilled before the options were exercised. As a result, a well-defined area of limestone high in calcium and low in silica is available. The rock is of a loose boulder-like formation yielding an unusually large amount of material of small sizes and fines. It has a low moisture content and it is easily ground.

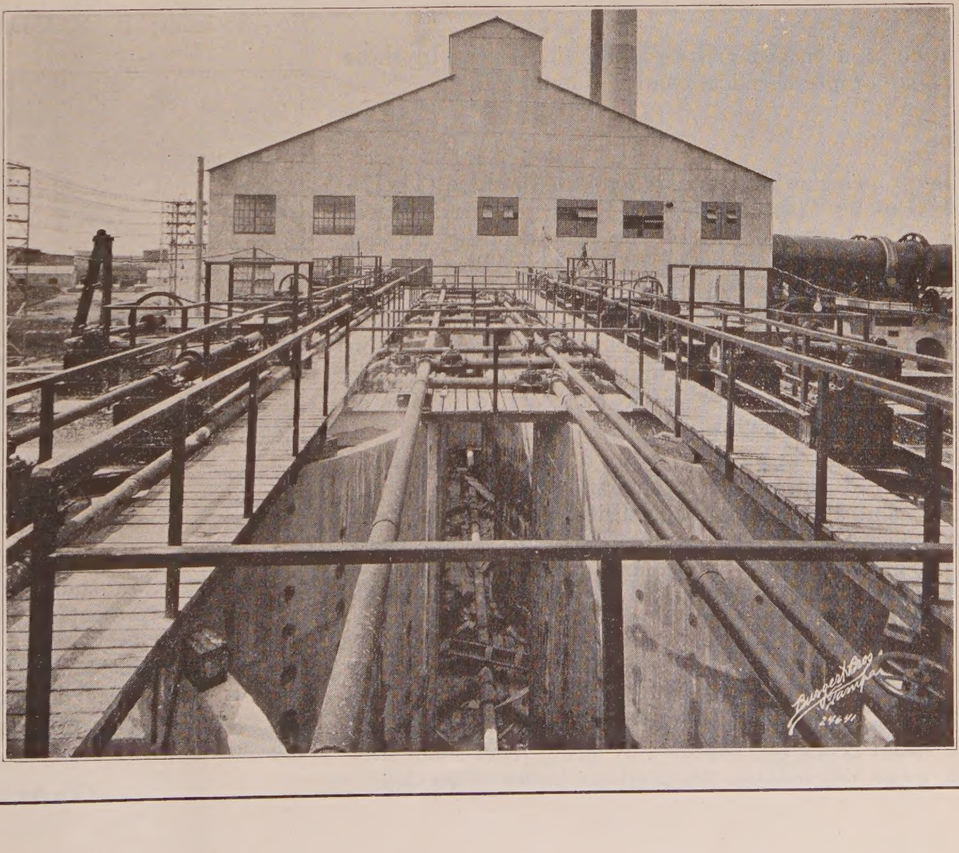
Plant Layout

The plant layout follows the general design of the plant built at Chattanooga, Tennessee, by the Cowham Engineering Company for the Signal Mountain Portland Cement Company. It utilizes the practice of minimum transportation of the materials and is built with the idea of conserving operating space and cost. The plant site consists of a 25-acre tract of land at Hooker's Point within the corporate limits of Tampa. The property abuts the deep water harbor and government channel of Sparkmans Bay.

The most imposing structure of the plant is the main storage building (800 feet long by 82 feet wide) which parallels the dock and provides direct loading and unloading from barges and boats. This building is of concrete and steel construction. The storage bins for clay, limestone, clinker, gypsum, and coal are served by two Whiting electric overhead traveling cranes, each equipped with a 2½-yard clamshell bucket. The limestone storage has a capacity of over 30,000 tons, approximately enough limestone to supply the plant at maximum production for 24 days. The clay storage has a capacity of about 14,000 tons. A clinker storage of 215,000 barrels is the major part of the building. A coal storage of 8,500 tons and a gypsum storage of 760 tons completes this building.

Handling Raw Materials

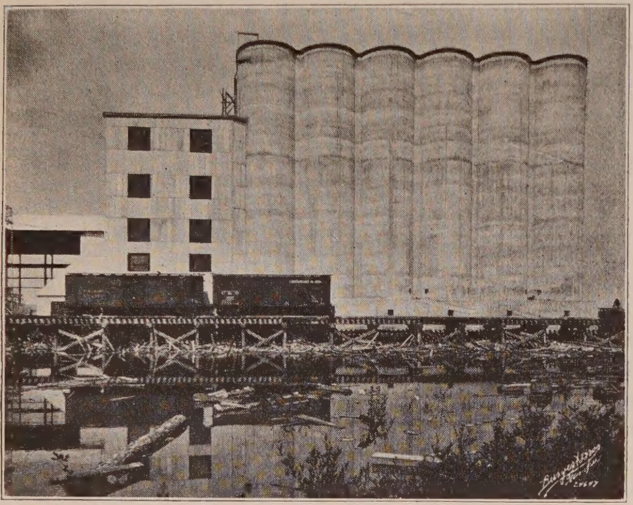
The cars of raw materials are run into a Wellman-Seaver-Morgan car dump which dumps the limestone or clay into a concrete pit of 30 carload capacity. An overhead crane takes the limestone from the concrete pit and dumps it into a steel hopper from which it falls to a Fairmont roll crusher. From here, the rock drops to an Allis-Chalmers rotary screen which delivers the fine material directly into the main storage and shunts the rock over 1 inch in size to a Dixie hammer mill. From the secondary crusher, the rock goes to the rock storage in the main storage building.



The 8 slurry mixing tanks. Six are for slurry storage and two are for rectifying

On one or two days of each week, clay is unloaded through the car dump and hoisted by an orange peel bucket to a hopper, from which it dumps direct into the main storage. A clay chute above the main storage receives the clay from the overhead traveling cranes and deposits it in a 26-foot Allis-Chalmers washing mill. This wash mill has a capacity of 23,600 gallons and is driven through a Texrope drive. From the wash mill, the clay goes into a concrete storage tank. The clay slurry is introduced into the compeb mills with the water and limestone.

A hopper above the feed end of the compeb mill receives the limestone from the overhead traveling cranes and a Stephens-Adamson apron feeder feeds the compeb mills from the hoppers. From the compeb mills, the slurry drops to a concrete sump and is pumped by two centrifugal pumps to slurry correcting tanks. There are eight of these tanks, two of which are rectifying tanks for chemical control. These tanks are 30 feet in diameter and 25 feet high, with a total capacity of 14,000 barrels. Both air and mechanical agitation are used. In these tanks, the proper chemical control is obtained.



Eighteen storage bins provide storage capacity for 141,000 *barrels of cement*

Kilns

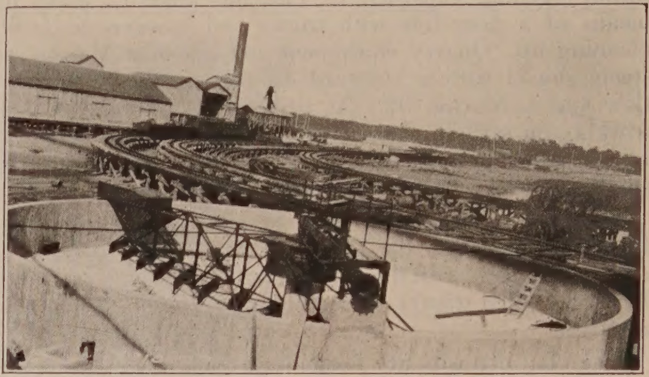
The properly mixed slurry is fed into the three (11x175 feet) kilns by Allis-Chalmers feeders of the ferris wheel type. The discharge end of the kiln deposits the hot clinker into 9-feet diameter by 70 feet long Allis-Chalmers coolers. These coolers, in turn, deposit directly into the clinker storage of the main storage building. Four Allis-Chalmers compeb mills fed by Stephens-Adamson apron feeders grind the clinker to finished cement, where it is picked up by a gathering screw and carried to one of two Fuller-Kinyon pumps.

From here, it is pumped to the cement storage bins. There are 18 bins (20 feet in diameter and 85 feet in height) and 10 irregular-shaped intervening bins. The total capacity is 141,000 barrels. Two Bates 4-tube packing machines sack the cement and a Weller belt carries the bagged cement directly to railroad cars on either side of the silo storage.

Power Plant

Power is supplied by one 4000-k.w. and one 1250-k.w. turbo steam generator, supplied by steam from three 900-b.h.p. waste heat boilers. An auxiliary boiler of 400-b.h.p. capacity is included for auxiliary and starting purposes. This power house equipment will furnish all of the power required in operating the plant. It is interesting to note that this is sufficient power to supply a community of 22,000 inhabitants with power and light.

Safety has been an important factor in the design of this plant. Wherever possible all drives throughout the plant are directly connected through Jones spur gear reduction units and, except for the roll and Fairmont crushers and the ferris wheel slurry feeders, there are no belts in the entire plant.



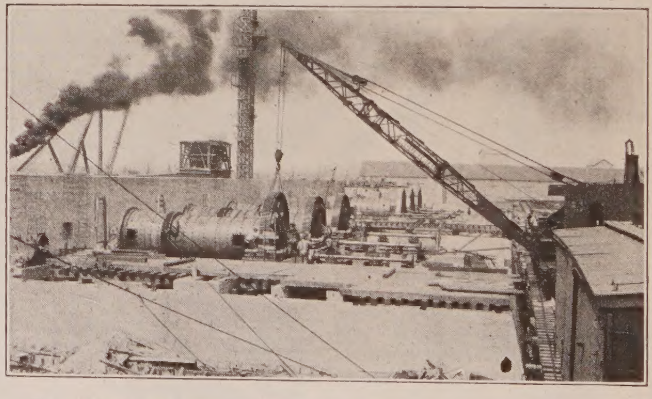
Showing the Dorr thickener

The several unique features of the plant such as the car dump, coal drying equipment, and power house will be described more in detail in a later article.

Personnel

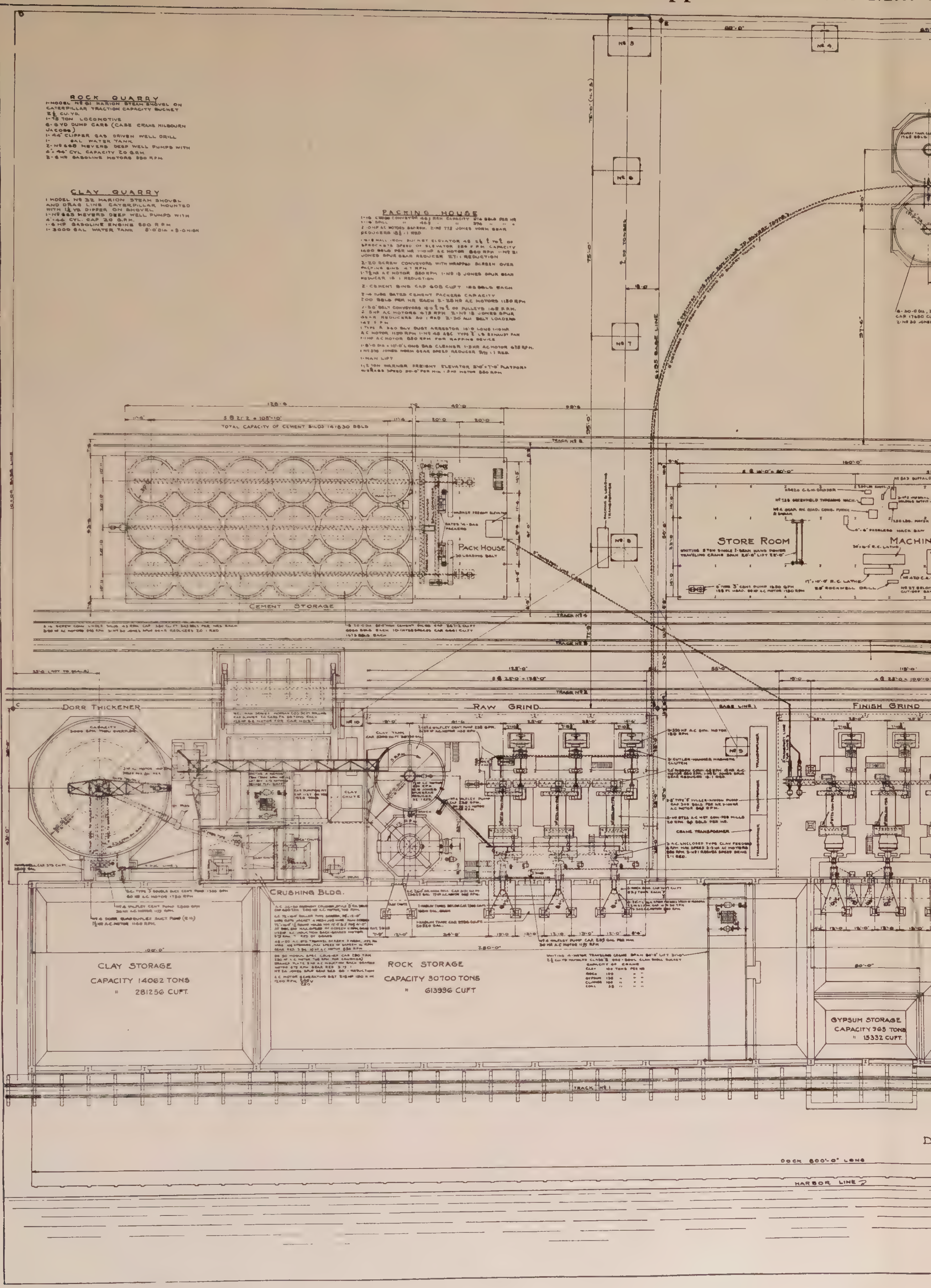
F. E. Dodge, chief engineer of the Cowham Engineering Company, has been in direct charge of the design and construction of the plant. O. A. Hartley was superintendent of construction and is continuing in the capacity of local superintendent of operation.

The following are officers of the Florida Portland Cement Company: John L. Senior, president; R. A. Drum, vice-president; R. N. Cowham, secretary and treasurer; Hiram Norcross, vice president of the Cowham Engineering Company, in charge of sales. Frank M. Traynor, former vice-president of the I. E. Schilling Company of Miami and, previous to that manager of sales for the Birmingham plant of the Lehigh Portland Cement Company, is local sales director. His organization consists of 7 representatives working throughout the state. C. A. McKeand is assistant to the president at Tampa.



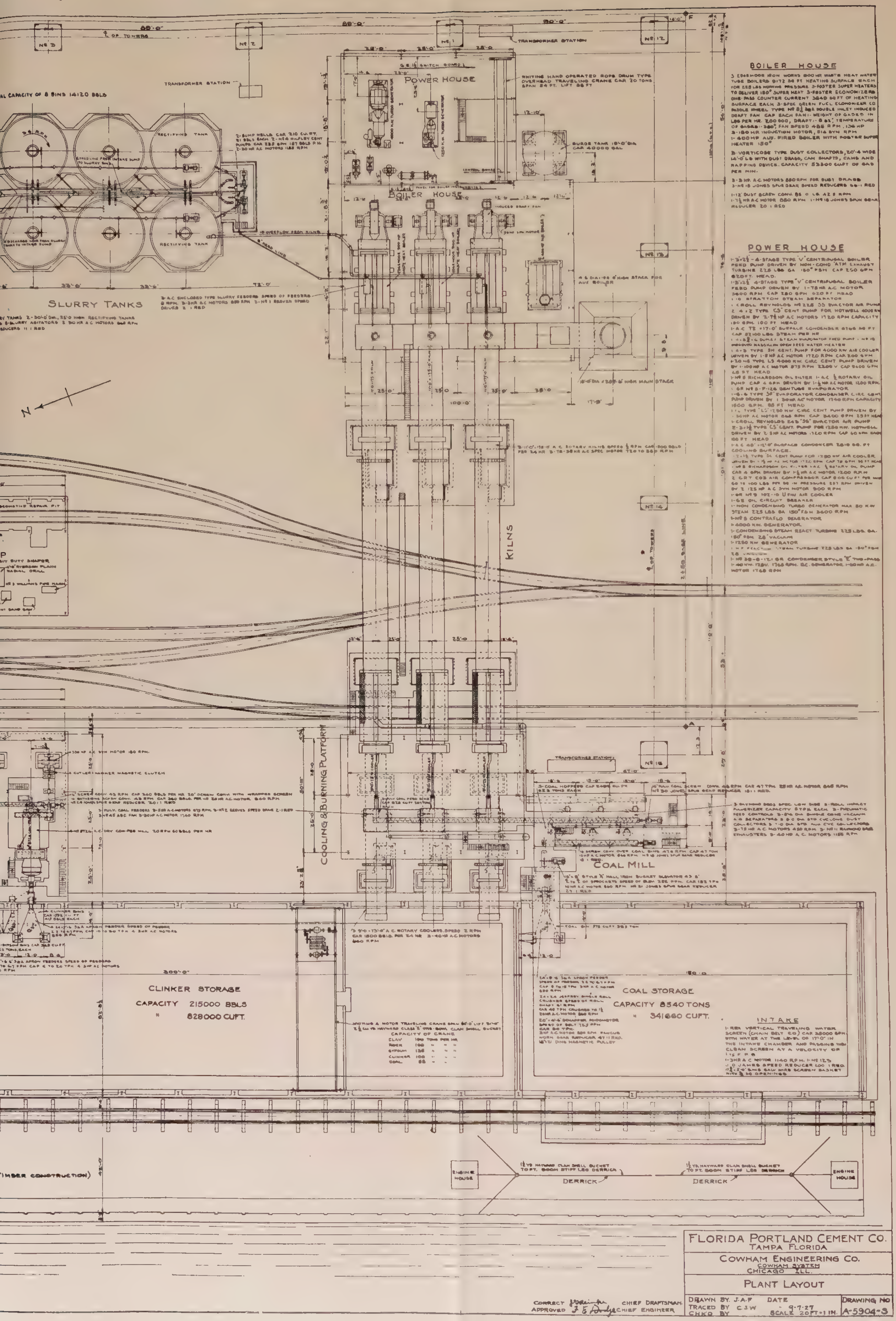
The grinding department during construction, showing the installation of compeb mills

(To be continued)


ROCK QUARRY
1-MODEL Nº 91 MARION STEAM SHOVEL ON CATERPILLAR TRACTION CAPACITY BUCKET 2½ CU. YD.
1-18 TON LOCOMOTIVE
6-6 YD DUMP CARS (CASE CRANE KILBOURN JACOBS)
1-44" CLIPPER GAS DRIVEN WELL DRILL
1- GAL WATER TANK
2-Nº 668 MEYERS DEEP WELL PUMPS WITH 4"x44" CYL CAPACITY 20 G.P.M.
2-6 HP GASOLINE MOTORS 550 R.P.M.
CLAY QUARRY
1 MODEL Nº 32 MARION STEAM SHOVEL AND DRAG LINE CATERPILLAR MOUNTED WITH 1¼ YD DIPPER ON SHOVEL
1-Nº 665 MEYERS DEEP WELL PUMPS WITH 4"x44 CYL. CAP 20 G.P.M.
1-6 HP GASOLINE ENGINE 550 R.P.M.
1-3000 GAL WATER TANK 8'-0" DIA x 8'-0" HIGH
PACKING HOUSE
2-CEMENT BINS CAP 608 CU.FT 100 BBLS EACH
1-MAN LIFT
TOTAL CAPACITY OF CEMENT SILOS 141830 BBLS
CEMENT STORAGE
PACK HOUSE
STORE ROOM
MACHIN
Nº 3
Nº 4
Nº 6
Nº 7
Nº 8
Nº 9
Nº 10
TRACK Nº 2
TRACK Nº 3
TRACK Nº 4
TRACK Nº 5
TRACK Nº 1
DORR THICKENER
RAW GRIND
FINISH GRIND
CRUSHING BLDG.
CLAY STORAGE
CAPACITY 14062 TONS
" 281256 CU.FT.
ROCK STORAGE
CAPACITY 30700 TONS
" 613996 CU.FT
GYPSUM STORAGE
CAPACITY 383 TONS
" 15332 CU.FT.
BASE LINE
DOCK 800'-0" LONG
HARBOR LINE

Copyright, 1927, Concrete Publishing Co.

tion of CONCRETE



BOILER HOUSE

3 EDGEMOOR IRON WORKS 800 HP WASTE HEAT WATER TUBE BOILERS 8172 SQ FT HEATING SURFACE EACH FOR 225 LBS WORKING PRESSURE 3-FOSTER SUPER HEATERS TO DELIVER 150° SUPER HEAT 3-FOSTER ECONOMIZERS ONE-PASS COUNTER CURRENT 3840 SQ FT OF HEATING SURFACE EACH 3-SPEC GREEN FUEL ECONOMIZER CO. PADDLE WHEEL TYPE Nº 8½ [illegible] DOUBLE INLET INDUCED DRAFT FAN CAP EACH FAN:- WEIGHT OF GASES IN LBS PER HR. 200 000, DRAFT:- 8 ½", TEMPERATURE OF GASES:- 380°, FAN SPEED 485 RPM, 130 HP 3-150 HP INDUCTION MOTOR, 514 SYN RPM 1-400 HP AUX. FIRED BOILER WITH FOSTER SUPER HEATER 150°

3-VORTICOSE TYPE DUST COLLECTORS, 20'-4 WIDE 14'-0 LG WITH DUST DRAGS, CAM SHAFTS, CAMS AND RAPPING DEVICE. CAPACITY 53300 CU.FT OF GAS PER MIN.

3-3 HP. A.C. MOTORS 880 RPM FOR DUST DRAGS 3-Nº 18 JONES SPUR GEAR SPEED REDUCERS 56:1 RED

1-12" DUST SCREW CONV. 85' 0 LG. 42 8 RPM 1-7½ HP A.C. MOTOR 880 RPM 1-Nº 18 JONES SPUR GEAR REDUCER 20:1 RED

POWER HOUSE

1-3"x2½"-4-STAGE TYPE "V" CENTRIFUGAL BOILER FEED PUMP DRIVEN BY NON-COND. ATM. EXHAUST TURBINE 225 LBS GA 150° FSH CAP 250 GPM 620 FT. HEAD.
1-3"x2½" 4-STAGE TYPE "V" CENTRIFUGAL BOILER FEED PUMP DRIVEN BY 1-75 HP A.C. MOTOR 3600 RPM CAP 250 GPM 620 FT HEAD
1-10 STRATTON STEAM SEPARATOR
1 CROLL REYNOLDS Nº 225 SS EVACTOR AIR PUMP
2 4x2 TYPE "CS" CENT PUMP FOR HOTWELL 4000 KW DRIVEN BY 2-7½ HP AC MOTORS 1720 RPM CAPACITY 180 GPM 100 FT HEAD
1-A.C. 72 x17-0" SURFACE CONDENSER 6100 SQ FT CAP 52100 LBS STEAM PER HR
[illegible] STEAM EVAPORATOR FEED PUMP 1 Nº 18 [illegible] OPEN FEED WATER HEATER
1 4x3 TYPE "SH" CENT. PUMP FOR 4000 KW AIR COOLER DRIVEN BY 1-5 HP AC MOTOR 1720 RPM CAP 200 GPM
1-20 Nº TYPE LS 4000 KW. CIRC CENT PUMP DRIVEN BY 1-100 HP AC MOTOR 875 RPM 2300 V CAP 9400 GPM 48 FT HEAD
1-Nº 5 RICHARDSON OIL FILTER 1-A.C. ½ ROTARY OIL PUMP CAP 4 GPM DRIVEN BY 1-½ HP AC MOTOR 1200 RPM.
1 GF Nº 5-P-128 BENTUBE EVAPORATOR
1-6x4 TYPE "SF" EVAPORATOR CONDENSER CIRC CENT. PUMP DRIVEN BY 1 30 HP. AC MOTOR 1740 RPM CAPACITY 1800 GPM. 88 FT HEAD
1-[illegible] TYPE "LS" 1250 KW CIRC CENT PUMP DRIVEN BY 1 30 HP AC MOTOR 868 RPM CAP 3400 GPM 25 FT HEAD
1-CROLL REYNOLDS 243 "SS" EVACTOR AIR PUMP
2-3x1½ TYPE "CS" CENT. PUMP FOR 1250 KW. HOTWELL DRIVEN BY 2-5 HP AC MOTORS 1720 RPM CAP 60 GPM EACH 100 FT HEAD
1-A.C. 40"x12'-0" SURFACE CONDENSER 2810 SQ. FT COOLING SURFACE.
1-2x1½ TYPE "SH" CENT PUMP FOR 1250 KW AIR COOLER DRIVEN BY 1-1½ HP AC MOTOR 1720 RPM CAP 75 GPM 35 FT HEAD
1-Nº 3 RICHARDSON OIL FILTER 1-A.C. ½ ROTARY OIL PUMP CAP 4 GPM DRIVEN BY 1-½ HP AC MOTOR 1200 RPM
2 GRT COB AIR COMPRESSOR CAP 806 CU FT PER MIN 60 TO 100 LBS PER SQ IN PRESSURE 257 RPM DRIVEN BY 2 125 HP AC SYN MOTOR 900 RPM
1-GE Nº 9 102-10 U FIN AIR COOLER
1-GE OIL CIRCUIT BREAKER
1-NON CONDENSING TURBO GENERATOR MAX 50 KW STEAM 225 LBS GA 150° FSH 3600 RPM
1-Nº 5 CONTRAFLO DEAERATOR
1-4000 KW. GENERATOR
1-CONDENSING STEAM REACT TURBINE 225 LBS. GA. 150° FSH. 28" VACUUM
1-1250 KW GENERATOR
1 [illegible] REACTION STEAM TURBINE 225 LBS GA 150° FSH 28 VACUUM
1-Nº 38-8-12:1 GR CONDENSER STYLE "E" TWO-PASS
1-40 KW. 125V. 1760 RPM. DC. GENERATOR, 1-60 HP AC. MOTOR 1760 RPM

INTAKE

1-REX VERTICAL TRAVELING WATER SCREEN (CHAIN BELT CO) CAP 25000 GPM WITH WATER AT THE LEVEL OF 17'-0" IN THE INTAKE CHAMBER AND PASSING THRU CLEAN SCREEN AT A VELOCITY OF 1.5 F.P.S.
1-3 HP A.C. MOTOR 1140 RPM. 1-Nº 125 J.D. JAMES SPEED REDUCER 200:1 RED
[illegible] 5-0" [illegible] WIRE SCREEN BASKET WITH [illegible] OPENINGS

CORRECT J. Reinke CHIEF DRAFTSMAN
APPROVED F. E. Doolge CHIEF ENGINEER

FLORIDA PORTLAND CEMENT CO.
TAMPA FLORIDA

COWHAM ENGINEERING CO.
COWHAM SYSTEM
CHICAGO ILL.

PLANT LAYOUT

DRAWN BY. J.A.F TRACED BY C.J.W CHKD BY	DATE 9-7-27 SCALE 20FT=1 IN.	DRAWING NO A-5904-3

New Plant of Dewey Portland Cement Company Has Interesting Features

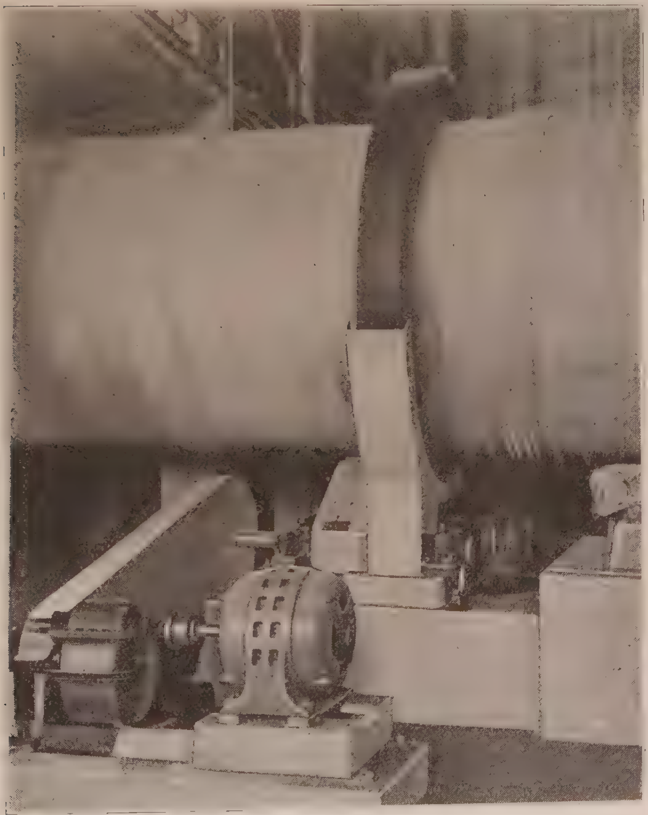
Kilns—Coolers—Cooler Feed Boxes—Coal Feed—Waste Heat Boilers—Power Plant—Coal Mill—Cement Storage and Packing—Shop and Office Buildings

Part II

By GORDON SMITH

THE kiln building, 75 feet wide and 340 feet long, adjoins the material storage building at the east end of the south wall, extending toward the river. This building houses the kilns, coolers, boilers and auxiliary apparatus, and the power house forms a 50 foot by 75 foot extension on the river end.

The kilns, of which there are two, with provision and foundations in for a third, are 11 feet in diameter by 175 feet long. They are fed from the slurry system by ferris wheel type feeders, the feed spout being of the conventional water-cooled type. The kilns are driven by 75-horsepower, two-speed motors through Falk herringbone gear type speed reducers and Link-Belt roller chain final drives, the chain drive being fully enclosed. No bevel gears are used in the kiln drive gear chain, and the axis of the driving motor is set parallel to the axis of the kiln.



Falk herringbone gear type speed reducers drive the kilns

The firing hoods of the kilns are mounted upon a concrete firing floor, extending behind the firing end of the kiln for a distance of about 50 feet and the full width of the building. This floor also carried the powdered coal feed bins, firing apparatus and blowers. The 8x70-foot rotary coolers are mounted beneath this floor. The last three feet of each cooler shell extends through an opening in the wall of the material storage building, and the coolers discharge into a reinforced concrete clinker pit in the storage room from which point all further handling of clinker is done by the crane as outlined before. The kilns and coolers were made by Allis-Chalmers. The first 50 feet of the kilns are lined with 9-inch fire brick and the remaining 175 feet with 6-inch brick.

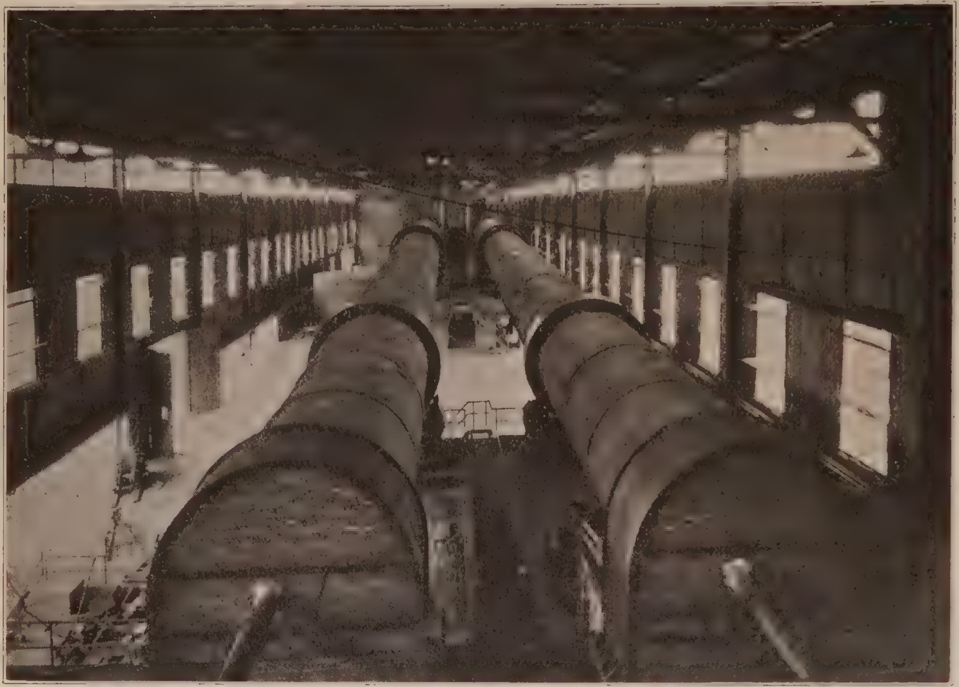
Cooler Feed Boxes

Between the kilns and coolers and located directly below the firing hood are the cooler feed boxes. These are heavily constructed steel plate boxes mounted on four 10-inch diameter flanged wheels running on 12-foot gauge tracks set in the concrete floor of the cooler pit. The boxes are lined with concrete and firebrick, arranged to form the feed chutes for the coolers and at the same time make a tight fit under the hoods to prevent dusting under the firing floor, and also to permit a maximum amount of heated air to be pulled into the kilns over the hot clinker. The air seal of the cooler rides against the cooler side of the feed box and the opposite side is provided with a steel plate inspection door, protected against the heat of the clinker falling through the box by a firebrick backing. The "roll-away" feature of these feed boxes makes them, as well as the feed end of the coolers, readily accessible for inspection and repair. This type of cooler feed box is the design of the J. C. Buckbee Company.

Coal Feed

Powdered coal is delivered into the kiln feed bins on the firing floor from the coal mill by a Fuller-Lehigh transport system. Beneath each feed bin is a twin-screw Allis-Chalmers coal feeder driven by a variable speed device also designed by the Buckbee company and consisting of a friction wheel mounted on a splined shaft driven from a 10-horsepower motor through a Texrope drive. This friction drives in turn a disc mounted on a sliding thrust shaft belted to the feed screws. The adjustments and controls are such that the burner has absolute control of the speed of the feed screws over a wide range. The apparatus is simple and conveniently arranged for inspection and repair.

The screws discharge into a 12-inch steel pipe extending through the kiln firing hood. Air is supplied for blowing the coal into the kilns by two 15,000 c.f.m. single inlet steel plate fans direct-connected to 60-horsepower motors. Each fan has sufficient capacity to fire three kilns and discharges into a receiver pipe, so arranged with pipe connections and valves as to permit either fan to carry the load and also permit of close control of the amount of air used. The fans are proportioned so that about 25 per cent of the air required for combustion is blown in with the coal, the balance coming through the coolers, cooler feed boxes and firing hoods, being thus preheated by the passage over the hot clinker.



A view of the kiln room. A third kiln may be installed in the near future

Waste Heat Boilers

Hot gases from the feed end of the kiln pass through the flue system and two Edge Moor 9200 square foot waste heat boilers, equipped with Foster superheaters and economizers, wherein steam is made at 225 pounds pressure and 150 degrees superheat. The gases after leaving the boilers pass through Green induced draft fans, and thence through the fan discharge flue underneath the boilers to the base of a 12-foot by 200-foot concrete stack. The boilers and flue system are equipped with dampers to permit the boilers being cut out and the kiln gases by-passed direct to the stack.

Boiler feed water is prepared in a Griscom-Russell evaporator system. Two 3-inch four-stage Worthington centrifugal boiler feed pumps are installed in the boiler room, one driven by a non-condensing Curtiss turbine and the other by a 60-h.p. motor. The evaporator outfit and a 400-h.p. Edge Moor hand-fired auxiliary boiler are installed in an extension on the west side of the waste heat boiler room, 24 feet wide.

Power Plant

The turbine station building is of concrete brick construction and forms an extension of the kiln and boiler room building toward the river. Here are installed the two main units, 1500 k.w. 2300-volt Allis-Chalmers turbo-generators running at 3600 r.p.m. These units are followed by 3200 square foot Elliott surface condensers with motor-driven circulating and condensate pumps. On the turbine floor, in addition to the main units, are a 200-k.w. Allis-Chalmers non-condensing house turbine and generator, two 60-k.w. motor generator exciter sets and a seven-panel 2300-volt main switchboard.

In the power house basement, in addition to the condensers and their auxiliaries, are installed three 333-k.v.a. single-phase transformers for supplying low tension current at 460 volts for the power house and boiler room motors, and two 1000-g.p.m. service pumps supplying water for general plant use.

Water Supply

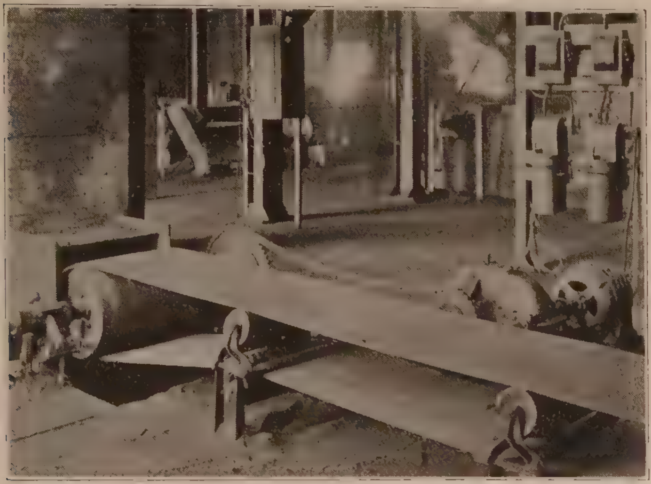
The power house lies about 400 feet inshore from the river channel, and two lines of 36-inch concrete pipe run underground from the intake chamber of the hot and cold wells of the power house to this channel. At the river end, these lines terminate in a concrete protecting wall, and at the power house end, in a concrete valve chamber built into the hot and cold well structure. This chamber and its valves permit either of the two pipes to be used as the intake. In this manner a reversal of flow may be obtained to aid in cleaning the pipes of silt and sediment from the river and it is thus possible to throw hot water from the condensers up-stream during the winter to aid in keeping the water intake clear of ice. A Chain-Belt traveling water screen is located between the valve chamber and the cold well proper.

The service pumps discharge into lines running underground to a concrete water tank situated west of the kiln building and south of the storage building. This tank is of reinforced concrete construction, 20 feet in diameter and about 80 feet high. The tank is divided into two chambers, the upper for distilled water and the lower for river water. Both are of about 35,000 gallons capacity.

The electrical work in this plant is very simply arranged. The motor load is grouped in "power centers" of convenient size, based upon the nature of the load and the location of the motors. Power mains from the 2300-volt board in the power house are then run to each center, where are located the transformers supplying 460-volt current for the small motors of each group, the motor circuits being run from the low tension busses of the transformer bank. Each motor circuit is fuse-protected and ahead of each motor starter is a quick-make-and-break safety switch. The motor circuits and mains are all run in rigid steel conduits. The mains are carried down the length of the kiln building in an overhead gallery running the full length of the building at the lower chord of the trusses and carrying in addition to the power lines: the air, water and slurry piping.

Coal Mill

The coal mill building is located at the northwest corner of the material storage building. Coal is received through a double-track hopper, underneath which there is installed a two-roll Link-Belt crusher, fed by a reciprocating plate feeder. The crusher product falls to a 24-inch belt conveyor, equipped with a magnetic head pulley, which discharges to the raw coal elevator delivering into the bin feeding the dryer. The latter is an 8-foot by 55-foot Ebro type made by Allis-Chalmers, set in a brick housing, and equipped with hand-fired grates. The hot gases from the dryer pass through a steel plate dust-collecting flue lined with gunite concrete before reaching the exhaust fan which discharges to the dryer stack. The dust caught in this flue is collected by a screw conveyor running along the bottom of the flue and delivered, along with the dryer discharge into a second elevator, which in turn delivers the dry coal into a series of screw conveyors over the coal mill feed bins.



The coal conveyor belt which feeds the raw coal elevator

Provision is made for the installation of four Raymond five-roller low-side mills, of which three are at present in place. The coal mills are arranged in a square, and, with their air separators, fans, collectors, feed bins and screw conveyors, are partitioned off from the the rest of the mill. This arrangement was made in the interest of safety and the reduction of the explosion hazard, inasmuch as the dryer and its fire are thus kept entirely separated from the grinding mills and the apparatus handling the finely divided coal.

The discharge of the Raymond mills is handled by screw conveyors to the feed hoppers of two six-inch Fuller-Lehigh coal pumps which transport the pulverized fuel through a 5-inch line to the kiln feed bins on the firing floor. Pneumatic valves and electric bin signals control the distribution of the coal to the proper bin.

Cement Storage

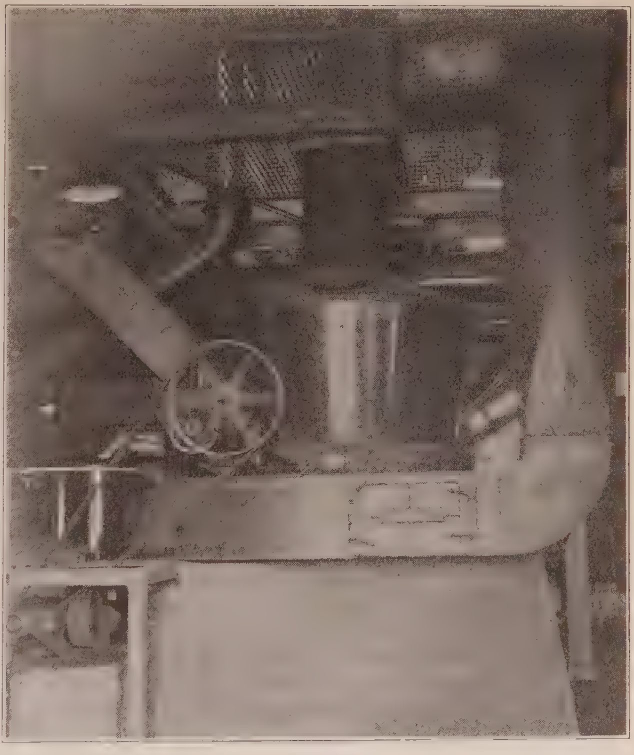
Finshed cement from the compeb mills is pumped to the storage tanks through a 5-inch transport line by either of two 8-inch Fuller-Kinyon cement pumps located in the mill room. The transport line crosses the material storage building in a gallery at the level of the lower chord of the roof trusses and thence on an overhead gallery to the storage tanks, up and into the cupola running the full length of the tanks and there branches lead to the individual bins.

Six 32-foot diameter by 80-foot high tanks, with wing and interstice bins afford facilities for about 120,000 barrels of cement storage. The pack house extends across one end of the tanks, which are arranged in two rows of three each, with two cement loading tracks on each side. Cement is withdrawn from the tanks through chutes into four lines of 12-inch screw conveyors, each driven by its own motor through a speed reducer. These screws discharge into a 16-inch cross conveyor which in turn discharges into either of two 16x9x12-inch chain and bucket elevators in concrete casings with steel head sections. These are followed by 20-inch screening screw conveyors over the packer bins. Two three-tube packers are at present installed with provision for two more at any time. A two ton electric platform elevator serves all floors of the pack house for handling sacks and supplies.

The packers and batch type bag cleaner are served by a Sly dust collector system and all bag sorting, cleaning, mending and tying are done within the pack house building. Future plans, now under discussion, call for an extension of the stockhouse by the construction of six or eight more tanks and an extension of the pack house to provide truck loading facilities and additional space for handling and storage of sacks.

Shop and Office Buildings

The shop building is located south of the west end of the material storage building, and is 72 feet by 122 feet in plan. The walls are of concrete brick, with steel frame construction and concrete tile roof. Two lines of interior columns divide the building into three bays lengthwise. The roof is elevated in the center bay providing excellent ventilation and light throughout and clearance room for a 5-ton hand-power crane running the full length of the building over a standard gauge track, which, through its connection with the general yard tracks, provides facilities for bringing yard and quarry equipment into the building for repairs, as well as facilitating the unloading



One of the three Raymond coal mills

and handling of supplies and materials.

The shop equipment is most complete and is such as to enable the plant to make practically all of its heavy repairs without going outside. Each machine tool is individually motor driven.

The office building is to the east of the boiler end of the kiln building, is 65 feet by 84 feet in plan, one story and full basement, concrete brick walls with frame structure carrying a red cement tile roof. All interior partitions are of gypsum block and full plastered. The basement houses the heating plant and provides storage place for laboratory samples and other supplies. On the main floor in front are a large general office room with reception hall, private offices for the superintendent and his assistant, chemist and plant engineer, and the chemical and physical laboratories. The rear of the building contains a large locker room for employees.

General

The mill buildings throughout are of steel frame construction, with gunite side walls and cement tile roofs. Flat deck roofs are covered with a Johns-Manville asbestos roof. The buildings are well lighted by ventilating steel sash. Comfortable stairs and galleries provide access to all parts of the mill for maintenance work and inspection as well as operative attendance.

The foundations for the mill buildings, the water tank and shop and office buildings were constructed under general contract by the Priester Construction Co., of Davenport. The steel work was furnished and erected by McClintick Marshall; the side walls were built by the Gunite Concrete and Construction Co. of Kansas City and the concrete tile roofs by the Continental Cement Tile Co. of Chicago. The Johns-Manville roofing was put on by the Hoskins-Maxwell Roofing Co. of Quincy, Ill. Jones-Hettelsater Co. of Kansas City built the cement storage.

The company erected all the machinery, bringing its foremen and crew from the plant at Dewey. Fairbanks-Morse ball bearing motors are used throughout the plant, except on the compeb mills, motor generator sets and air compressors, about 80 such motors having been purchased. All conveying and elevating machinery was supplied by the Webster Mfg. Co. In general such machinery is driven by individual motors from Falk herringbone gear type speed reducers through Link-Belt enclosed roller chain drives. The U. S. Rubber Co. furnished the conveyor belting.

The erection of the machinery was in charge of Mr. G. S. Parker, formerly of the Dewey plant and now superintendent at the Davenport mill. The piping, furnished and fabricated by the Crane Co. and the electrical work was also installed by the company under the direction of Mr. E. B. Smith, plant mechanical and electrical engineer. Mr. H. F. Tyler, first vice-president of the company, was located at Davenport during the construction period and is now in general charge of all operations. Mr. E. S. Ernst is chemist at the Davenport plant. The J. C. Buckbee Company of Chicago were the consulting engineers and designers of the entire mill, their field work being in charge of Wm. H. Sayler.

The company's main offices are in Kansas City. Mr. F. E. Tyler is president and general manager, Mr. W. E. Tyler, vice-president and treasurer, Mr. R. W. Moore, vice-president and secretary and Walter Gray, vice-president and sales manager. Leo Capen is vice-president and in charge of sales at Davenport. Mr. D. M. Tyler, is vice-president and in charge at the Dewey mill where Mr. F. R. Chamberlain is superintendent and chemist.

Standardization of Pipe Flanges and Fittings

An unusually close approach to an ideal piece of standardization work in which the setting up of a new standard has kept pace step by step with a rapidly advancing industry is shown in a recent announcement by the American Engineering Standards Committee. It is in connection with the completion of the first of a series of standards for pipe flanges and fittings, representing the results of co-operative work on the part of more than a score of organized industrial groups, and extending over several years.

This particular standard is one of a group which are being developed by a very large representative sectional committee, composed of appointees from 28 organizations interested in the subject, working under the chairmanship of Dean Collins P. Bliss, of the School of Engineering, New York University; and under the joint sponsorship of the American Society of Mechanical Engineers, the Heating and Piping Contractors National Association, and the Manufacturers Standardization Society of the Valve and Fittings Industry.

Several years ago when the sectional committee began its work, a few steam power plants were in operation at 350 and 400 pounds pressure, and plans were being developed for one or two 600 pound stations. Except for the two lower pressures the field was therefore entirely clear, and the sub-committee mapped out a series of standard working pressures in geometric ratio, viz., 250, 400, 600, 900 and 1350 lb. per square inch. These pressures are meant as maximum working steam pressures at a temperature of 750 degrees F. (gage indication). Eventually the pressures of 2000 and 3200 lb. per square inch will be added.

The maximum permissible working pressures for hydraulic applications are correspondingly higher than those for steam applications. Thus, the maximum non-shock working hydraulic pressures at a temperature of 450 degrees F. are 325, 500, 720, 1080 and 1625 lb. per square inch (gage indication), whereas the maximum non-shock working hydraulic pressures at or near the ordinary range of air temperatures are 500, 750, 1000, 1500 and 2250 lb. per square inch (gage indication).

Chemical Exposition Has Students' Courses

A students' course was a part of the program of the Eleventh Exposition of Chemical Industries held in New York City, September 26th to October 1st, at the Grand Central Palace.

A logical division of students was made into two groups, the first comprising those having knowledge of elementary chemistry and the second, those having a more extensive knowledge of chemistry and chemical engineering. Classes met each day of the exposition.

Each group heard lectures by authorities on such subjects as mechanical separation, handling of material, and similar subjects, with reviews and discussions following each session.

The Fifth Chemical Industries Banquet was held during the Exposition on Wednesday evening, September 28th, under the auspices of the Salesmen's Association of the American Chemical Industry, and sponsored by chemical and ceramic societies.

Cement Cooling Equipment Installed at Bessemer Plant

A Practical Method of Cooling Cement as It Leaves the Compeb Mills Developed at the Plant of the Bessemer Limestone and Cement Company—Performance Data—Description of the Installation

DURING the past two years, engineers of the Bessemer Limestone and Cement Company at Bessemer, Pa., co-operating with the W. W. Sly Manufacturing Company of Cleveland, have been developing a new method of cooling cement as it leaves the compeb mills. About a year ago the equipment was installed and put into operation in the Bessemer plant. Its performance was carefully checked and it was found that the equipment functioned even more satisfactorily than was expected.

The process was developed for the following reasons:

(1) To prevent the burning and scorching of bags. Very few cement companies pack directly from the mill stream, but even when cement is stored in silos it loses very little heat and is often packed at temperatures ranging from 250 to 300 degrees.

(2) Hot cement is not as desirable as cool cement. Contractors sometimes refuse it.

(3) With some types of conveying equipment, the hot cement causes damage.

(4) The handling of cool cement promotes better working conditions and makes for greater safety.

(5) Keeping the dust out of the mill room lowers machinery maintenance. The cement cooling dust arresters do this.

Description of the Installation

The accompanying photographs and diagram illustrate the installation at the Bessemer plant. Figure 1 is a diagram showing the arrangement of the dust box or cooler attached to the discharge end of the compeb mills. The operation is simple and effective. The cement discharges from the mill into the dust box and onto the baffle plates. Cold air, which is drawn through an opening in the side of the dust box, passes through the cement as it leaves the compeb mills. Some of the hot cement is pulled into the dust arresters where it is cooled and dumped back into the mill stream. The balance of the cement cascades through the cooling box into the screw conveyor below. A 17½-inch dust pipe, exhausting 800 C.F.M., through which the hot cement is pulled into the dust arrester, is connected to the top of the dust box. An 8-inch pipe connecting with the 17½-inch pipe, exhausts the mill trunnion.

Figure 2 is a close-up of the dust box. Through the opening shown the air enters the dust box to be drawn

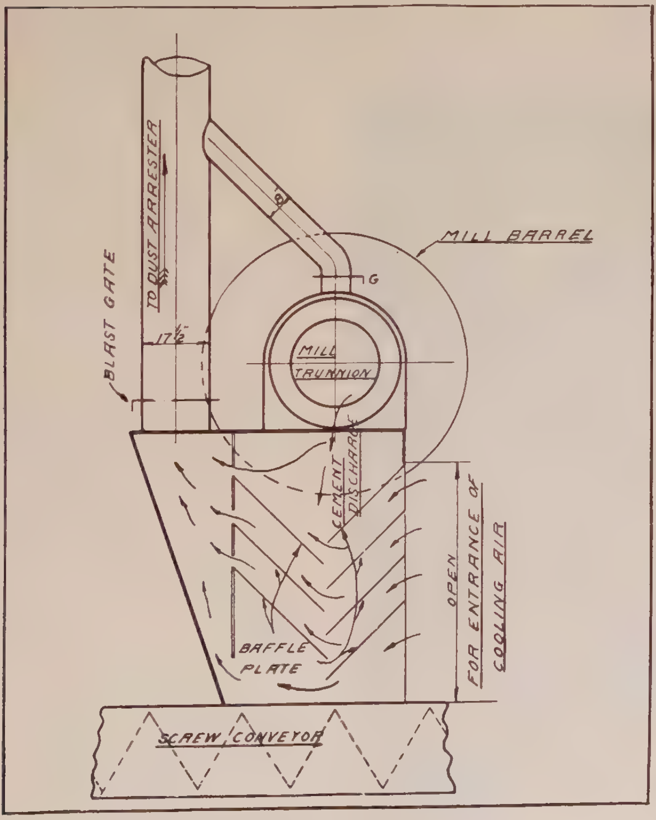


Figure 1

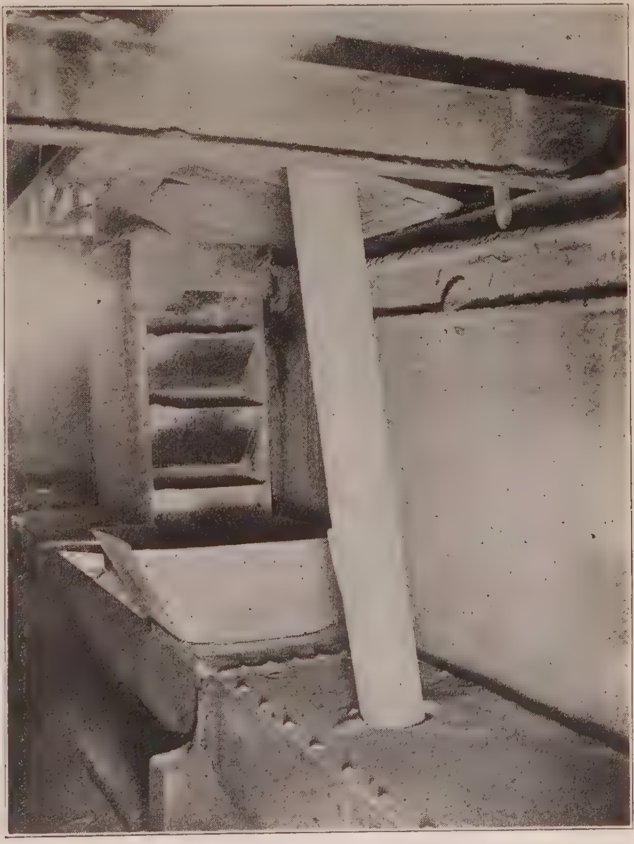


Figure 2. The dust box with the discharge pipe from the Sly dust arrester in the foreground

through the cement as it falls onto the baffle plates. The pipe in the foreground is the discharge from the Sly dust arrester and carries the cool cement back into the main conveyor. The photograph was taken under a walkway below the discharge trunnions of the 4 compeb mills while they were all in operation. The freedom from dust is shown by the sharpness of the photograph.

Figure 3 illustrates the series of dust boxes or coolers, one at the end of each mill. It also shows the 17½-inch dust pipe exhausting the dust box. The screw conveyor carries the cement from the mills to storage.

Figure 4 is an end view, showing the double file arrangement of the arresters. The large pipe in the foreground to the left is the 17½-inch pipe that exhausts the dust box. The right hand battery of dust arrester hoppers discharges directly from the hoppers into the main screw conveyor under the system, as shown in Figures 1 and 2. The left hand battery discharges into a 9-inch screw conveyor which in turn discharges into the main screw conveyor below.

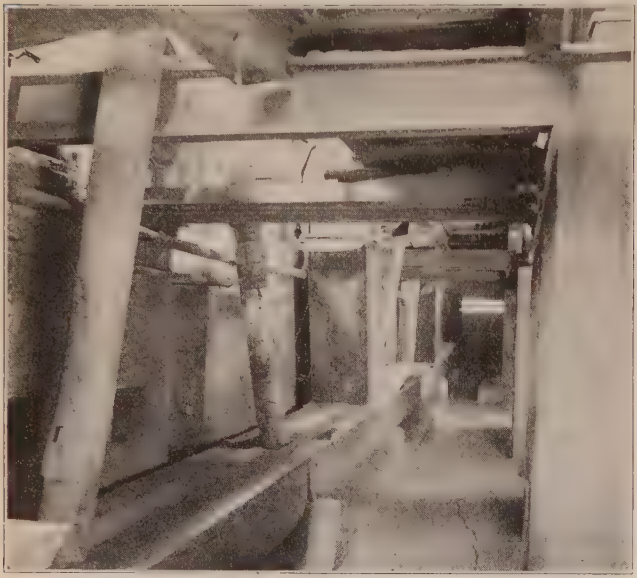


Figure 3. A series of dust boxes and the pipe exhausting the box

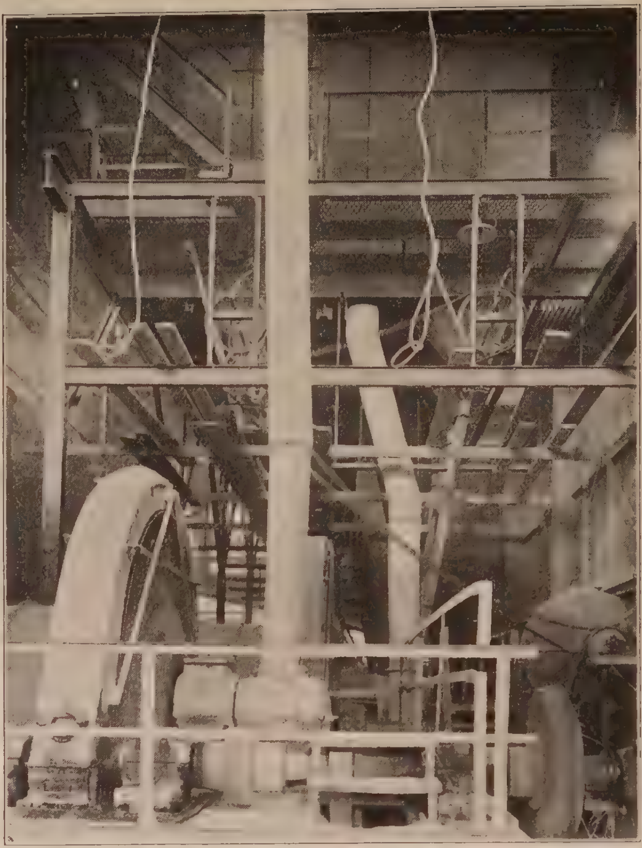


Figure 4. End view of the arresters showing the double file arrangement

Figure 5 is a side view showing the 9-inch upper screw

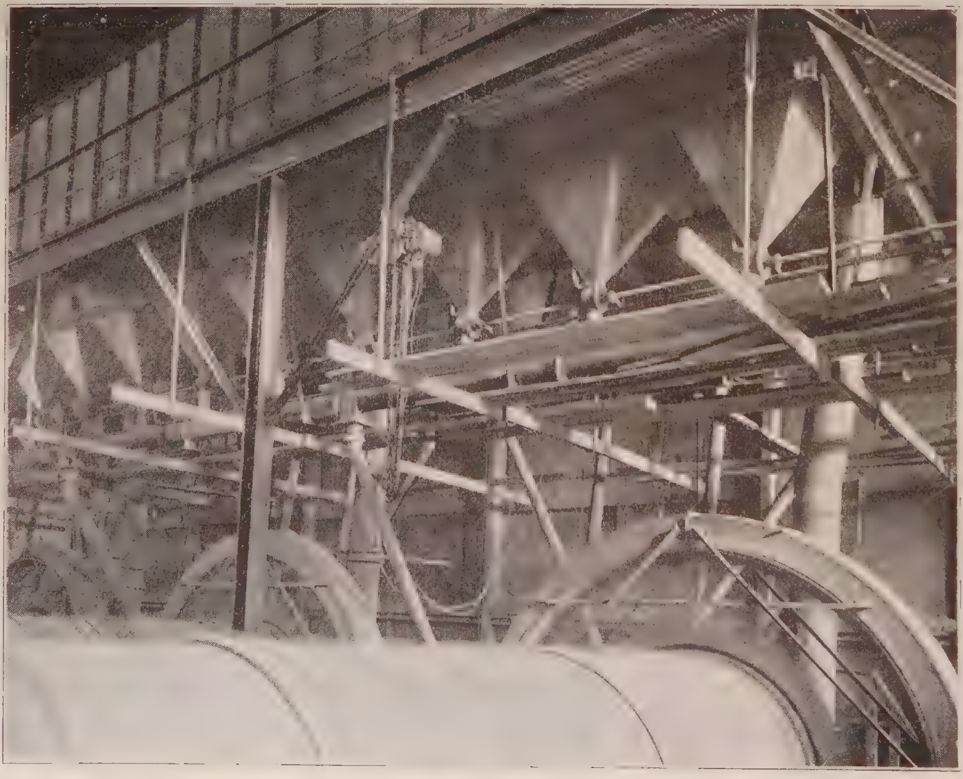


Figure 5. Side view of the arresters. The 9-inch upper screw conveyor is seen under the left hand battery of hoppers

conveyor under the left hand battery of hoppers and the discharge pipes leading to the lower conveyors.

Table of Temperatures

The following table, showing the performance record of the installation, indicates an average drop in the temperature of the cement of 109 degrees. The temperature of cement as it leaves the screw conveyor is low enough to permit packing direct from the mill stream.

Temperature of Cement at Discharge Trunnions of Mills				Mixture at Screw Conveyor	Average Drop in Temp.	Clean Air Temperature at Fans			
No. 4	No. 6	No. 8	No. 10			No. 4	No. 6	No. 8	No. 10
deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.
340	325	321	315	237	88	160	170	160	180
320	337	317	328	234	92	163	169	174	185
328	326	314	306	197	120	160	162	166	171
352	361	342	340	236	113	171	186	183	181
360	351	349	341	222	128	172	180	182	179
363	375	362	327	240	112	162	183	186	178
362	337	345	334	244	101	162	down	176	179
349	363	343	down	230	122	165	173	182	down
Average		339		230	109				

Notes on the Use of Sandy Clay in Portland Cement Manufacture

By EDUARDO TAYLOR

Cebu Portland Cement Company, Naga, P. I.

A CLAY that contains much over 5 per cent of mineral impurities such as sand, pebbles, flint, quartz, etc., is not usually considered a very suitable raw material for manufacturing portland cement. It is generally believed that these impurities remain inert in the kiln, causing a decrease in the strength of the resulting cement and making the material rather hard to burn unless it is ground extremely fine.

At our plant there is a deposit of alluvial clay that contains an average of 15 per cent of sand and pebbles (as determined by washing through a 100-mesh sieve). Sometimes these impurities amount to as much as 32 per cent. On account of the proximity to the plant of this deposit, we decided to give the material a trial, after finding that the chemical composition of the clay was satisfactory. As the plant is not equipped with a wash mill, the clay was used without any preliminary treatment.

No deleterious effects were noted from the continued use of this clay. The strength of the cement was by no means adversely affected. In fact, the strength increased, although this increase was doubtless due to intentional changes of the composition in other directions. No difficulty was experienced in burning the clinker, the coal consumption averaging around 98 pounds per barrel.

The percentage of insoluble residue was determined daily on the clinker. The average result for a whole month was 0.20 per cent, which indicates that a large portion of the impurities in the clay went into combination in the kiln. If the impurities remained inert in the kiln, the insoluble residue would be over 1 per cent, using our usual mix. The impurities in the clay itself are insoluble in acid except a few grains of lime carbonate.

It is very possible that the use of this clay has given satisfactory results because of the small quantity required of it in our mixes. Our average mix is about 12 parts of cement rock to each part of clay. The fact that our slurry is ground to a fineness of at least 85 per cent on a 200-mesh sieve may also be offsetting any bad effects of the sand in the clay.

However, as the tensile strength of our cement averages 325 pounds in 7 days and 424 pounds in 28 days, it is evident that we would still be getting a satisfactory product even if our clay were sandier, or if we were obliged to use more clay in our mixes, or if our slurry were ground coarser.

It seems that the allowable sand content of clay may be much higher than the quantity fixed by some writers on cement manufacture.

Japanese Association Restricts Cement to Be Marketed

The Japan Cement Association has adopted a plan to restrict the amount of cement to be forwarded to the market. This is a counter step for the over-stocks and the consequent price depression. The plan was operative on and after July 20 all over the country. The ratios of restriction are: Asano Portland Cement Company is restricted by 45 per cent, Chichibu Cement 10 per cent, the Nippon Cement 10 per cent, the Iwaki Cement 9 per cent, the Onoda Cement 9 per cent, the Oita Cement 5.5 per cent, the Toyokuni Cement 4 per cent, the Tosa Cement 3 per cent, the Ube Cement 2 per cent, the Sakura Cement 1.5 per cent and the Chuo Cement 1 per cent.

The Nippon Cement Company is said to be nearly bankrupt, due to the prolonged business depression and over-extension of enterprises. The price of the company's stock, 50 yen paid-up, has gone off to 10 yen. The firm has said it will readjust its business and asked the creditors to give one month's delay in refunding debts. The company's mill have been closed since a week ago. It is expected the mills will be reopened on the completion of readjustment.

Work Begun on Power and Mechanical Exposition

The sixth National Exposition of Power and Mechanical Engineering has already leased floor space in the Grand Central Palace, New York City, equal to that of the show held in 1926, which occupied four floors of the Palace. The exposition is held annually and this year will open December 5th and continue to December 10th.

As is customary, exhibitions of heating and ventilating machinery, power transmission equipment, machine tools, measuring instruments, and so forth, will be represented.

The show will again parallel the annual meetings of the American Society of Mechanical Engineers and the American Society of Refrigerating Engineers.

British Specifications for Portland-Blast Furnace Cement Revised

New Standard Specifications for Mixtures of Portland Cement and Blast-Furnace Slags—Methods of Making Tests—Chemical and Physical Requirements

By A. C. BLACKALL

IN the British standard specification for Portland cement issued by the British Engineering Standards Association, the body which in England corresponds to the U. S. Bureau of Standards in America, it is laid down that no cement to which slag has been added or which is a mixture of Portland cement and slag will comply with the specification. It is added in a footnote, however, that a separate specification has been drawn up by the association which admits of added slag, under the title of "British Standard Specification for Portland-Blastfurnace Cement."

This specification was issued in 1923, but had been withdrawn for some time while undergoing revision. The revision has now been completed and the new modified specification has just been issued.

Mixture of Cement and Slag

With regard to the composition and manufacture of Portland-blastfurnace cement, the new specification stipulates that it shall consist of a mixture of Portland cement clinker and granulated blast furnace slag. These two materials may be mixed together in such proportions as the manufacturer may prefer, subject to the proviso that in no case shall the proportion of slag exceed 65 per cent of the total quantity.

It is further stated that the Portland cement clinker shall be manufactured by intimately mixing together calcareous and argillaceous or other silica and alumina bearing materials, and burning them at a clinkering temperature. The granulated blast furnace slag shall then be added to the Portland cement clinker and the whole ground together so that the two constituents shall be thoroughly and intimately mixed, and shall produce a cement capable of complying with the specification.

The stipulations in regard to samples for testing; cost of tests, analyses, and samples; tests for fineness, tensile strength, setting time, soundness; non-compliance with tests; costs of vendor's tests and analyses, etc.; and delivery are all identical with those in the standard specification for portland cement.

Proportioning Tests

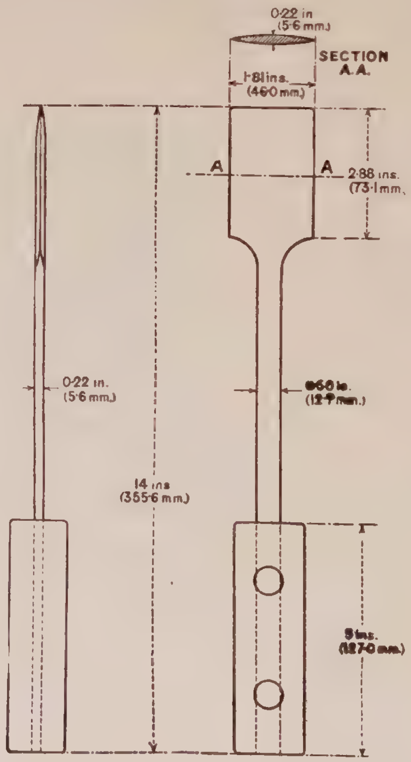
The following is the method authorized for estimating relative proportions of portland cement clinker, and blast furnace slag. The sample of cement shall be dried in an air oven for not more than an hour at 105° Centigrade and shall then be sifted through a sieve having 180x180 meshes per square inch (if after using this sieve the flotation separation does not give sufficient quantity of slag for analysis a finer sieve should be used), the residue A retained on the sieve only being taken for examination. The required separation of the constituents of the cement shall be effected by the use of pure acetylene tetrabromide, of 2.90 to 2.95 specific gravity, or of a mixture of methylene iodide and turpentine of similar specific gravity.

A weighing bottle containing 40 cubic centimeters of the above liquid shall then be taken and ten grammes of the residue A introduced, the whole being well shaken and allowed to rest. The introduced residue A will then separate into two portions, the lighter portion B rising to the surface of the liquid, while the heavier portion C will sink to the bottom. When this separation has distinctly taken place, the upper liquid (containing the lighter portion B) shall be carefully poured off through a 180x180 sieve (or the finer sieve which may be used for obtaining residue A as suggested above) in such a manner that the portion B shall be retained theron. This portion shall then be washed with ether and dried. The heavier portion C shall then be similarly treated.

The lighter portion B, after being washed and dried as described above, shall then be treated in a manner similar to that detailed in connection with the original residue A, except that a mixture of acetylene tetrabromide and carbon

BRITISH ENGINEERING STANDARDS ASSOCIATION

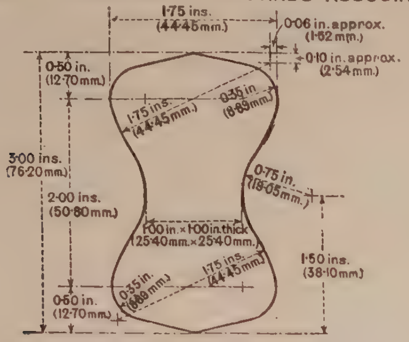
STANDARD SPATULA.



The Standard Spatula shown above is of Steel with a wooden handle securely rivetted on. The total weight shall not exceed (12 ozs. (340 grammes), and the centre of gravity shall fall within 0·25 inch (6·4 mm.) of the centre of the length of the spatula.

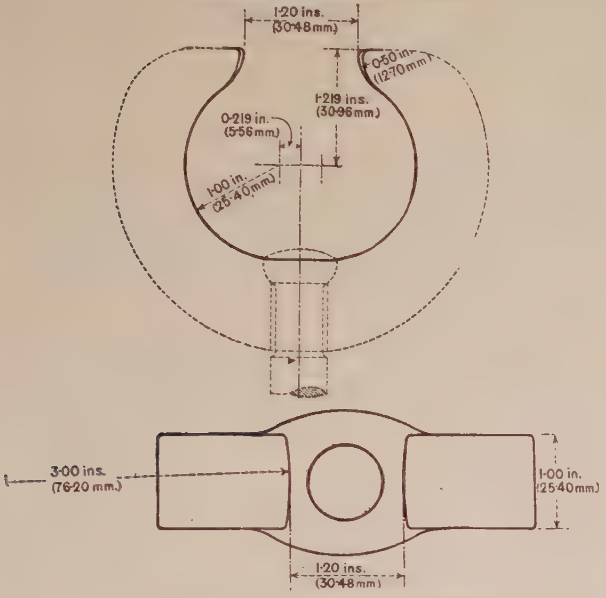
Note.—The figures in brackets are approximate equivalents tetrachloride, having a specific gravity of 2.70 (or mixtures as above described having that specific gravity) shall be used. A crystal of calcite is convenient for determining the specific gravity of the mixture. Separation into two portions will result as before. The lighter portion B_1, rising to the surface, will consist of gypsum, coal ash and other light material, and is rejected. The heavier portion B_2, sinking to the bottom of the liquid, consists of slag. A single separation (as above) is usually sufficient for ordinary purposes.

BRITISH ENGINEERING STANDARDS ASSOCIATION



Briquette to have an uniform thickness of 1 inch throughout.

Fig 1. Dimensions of Standard Briquette.



Figs. 2 and 3. Elevation and Plan of Jaws for Holding Briquette.

Note —The figures in brackets are approximate equivalents

Three estimations of the lime content shall be made, namely, one on the original mixture A, one on the heavy portland cement clinker C, which sinks in pure acetylene tetrabromide or in the alternative liquids, and one on the slag B_2.

The proportions of portland cement clinker and slag in the cement can then be determined by the following formulæ:

$$\text{(1) Percentage of portland cement clinker} = \frac{(\text{Percentage of lime in the cement} - \text{percentage of lime in the slag}) \times 100}{\text{Percentage of lime in the portland cement} - \text{percentage of lime in the slag}}$$

and

(2) Percentage of slag = 100—per cent of portland cement clinker.

If the quantity of slag thus determined approaches the specified limits within 3 per cent, the heavier portion C should be further treated with a mixture of methylene iodide and benzene or of methylene iodide and turpentine of 3.10 specific gravity to ensure the absence of slag in such heavier proportion, any material which floats in this heavier liquid being rejected.

With regard to tests for relative proportions of portland cement clinker and blast furnace slag, it is specified that these shall be determined by taking a portion of the sample or samples and treating it by the flotation method above described. The cement shall comply with the following conditions as to its chemical composition:

The principal alterations embodied in the new edition of the specification are identical with those introduced into the new British standard specification for portland cement issued in 1925. The following summary of tests is now given at the beginning of the specification:

(a) Proportions of slag and portland cement clinker. The proportion of slag not to exceed 65 per cent and that of portland cement clinker to be not less than 35 per cent.

(b) Fineness. Residue on 180x180 sieve not to exceed 10 per cent and residue on 76x76 sieve not to exceed 1 per cent.

(c) Chemical composition of the cement.
  (1) Loss on ignition not to exceed.......... 3 per cent
  (2) Insoluble residue not to exceed..........1.5 per cent
  (3) Magnesia not to exceed.......... 5 per cent
  (4) Sulphur present as and calculated as sulphuric anhydride not to exceed.......... 2 per cent

(d) Chemical composition of the portland cement clinker.
  (1) The hydraulic modulus (or ratio of lime to silica and alumina) to be not greater than 2.90 nor less than 2.0.
  (2) Loss on ignition not to exceed.......... 3 per cent
  (3) Insoluble residue not to exceed..........1.5 per cent
  (4) Magnesia not to exceed.......... 4 per cent
  (5) Total sulphur calculated as sulphuric anhydride not to exceed..........2.75 per cent

(e) Tensile strength (neat cement). Not less than 600 lbs. per square inch at 7 days.

(f) Tensile strength (cement and sand). 3-1 sand cement mortar not less than 325 lbs. per square inch at 7 days and 365 lbs. per square inch at 28 days on a sliding scale, as per formula, if the seven days' tests are higher than 325 lbs.

(g) Setting time.
Normal setting cement.—Initial set of not less than 30 minutes and final set of not more than 10 hours.
Quick setting cement.—Initial set of not less than 5 minutes and final set of not more than 30 minutes.
(The term "quick setting" cement does not necessarily imply that the cement hardens quickly.)

(h) Soundness.—Expansion by the "Le Chatelier" test not more than 10 mm. (0.40 in.) after 24 hours' aeration, or 5 mm. (0.20 in.) after 7 days' aeration.

Before any sample is submitted to tests (c), (d) and (f) it shall be spread out at a depth of 3 inches for 24 hours in a temperature of from 58 to 64 degrees Fahrenheit (14.4 to 17.8 degrees Centigrade). The temperatures stated are applicable to temperate climates. For cement intended for use in tropical or other hot countries any higher temperature up to 95 degrees Fahrenheit (35 degrees Centigrade) may be substituted. In other climates special arrangements between vendor and purchaser must be made unless the temperatures stated in the specification can be artificially obtained in the laboratory or other place where the tests are made.

EDITORIALS

Supply and Demand

THE Department of Commerce has published, in preliminary form, the 1926 statistics of the cement industry in the United States. It is an encouraging report, showing that the 1926 production of portland cement—164,530,170 barrels — was larger than for any previous year and 2 per cent greater than the next highest year, 1925. Production was 80.5 per cent of the indicated capacity at the close of the year.

Estimates for 1927 indicate a growth in production and demand, but they also indicate a widening gap between production capacity and demand.

The average factory price of cement during 1926 showed a decrease of 6 cents per barrel as compared with 1925. The present year has seen further reductions in the price of cement, especially where it is in competition with imported cements and where special conditions have resulted in price wars.

The widening gap between supply and demand has been further aggravated by an upheaval of the existing marketing conditions. Last year saw the beginning of a definite trend toward a departure from the production and marketing of strictly standard brands of portland cement. The tendency has grown during 1927 until at the present time cements for which several definite claims are made are available in most of the United States. Incor, Velo, Quickard, Special and Super cements are now being made available to an increasing number of engineers and contractors.

The movement is cumulative and every week new rumors or announcements of another manufacturer who is, or is contemplating the, marketing of a cement of special quality comes to hand. Newspaper clippings setting forth the advantages of these cements are received regularly.

Whether there has been a definite demand on the part of the user for these special cements or whether the manufacturers have created that demand is beside the point. Certain it is that portland cement manufacturers who not long ago were selling only a standard product have themselves undertaken the manufacture and sale of special cements.

Perhaps this was the result of a new demand or perhaps it was an answer to the criticisms and competition of some of the other building material interests. The new competition of industry against industry may have been the cause of the demand for special qualities in cements.

The cement industry is beginning to face this new problem in supply and demand frankly. If some types of cement make less desirable concrete than others, that fact should be ascertained and met. If high early strength is a quality that will enable concretors to meet the competition of other building materials more readily, the welfare of the industry will be influenced by its decisions to supply or not to supply cement having the quality of early hardening.

With a steadily growing gap between supply and demand and with keener co-operative competition from other industries, the cement industry must do its utmost to maintain favorable conditions within itself. To do this, it must take the user into its confidence and gain his co-operation. It must discuss its problems frankly with the user, admitting that perfection has not yet been attained and working with him to improve the quality of concrete and even of cement, if that seems to be necessary.

Dust

IN a recent legal decision the court expressed the opinion that small quantities of cement dust were not harmful and that therefore the residents of a certain community adjacent to a cement plant could not secure damages from the cement manufacturing company.

Research over a long period of time has shown conclusively that cement dust is not harmful to workers and to people living near cement plants. Investigators both here and abroad are fairly well agreed on that point.

But, even though dust is not harmful, it is a nuisance. And it is unnecessary. Each year many older cement plants take steps to eliminate dust and new plants, built during the past year or two, have been made entirely dustless.

Aside from the operation advantages in reducing equipment maintenance and increasing safety in the plant, an investment in dust collection equipment is worth while from the standpoint of the good will of the workers and of the community in which the plant is located. The proper handling of cement dust is not something for which the manufacturer deserves praise. Rather it is his duty both to his employees and to his community.

Accident Prevention

TO anyone attending the safety meetings of the cement industry, the reason for the enviable standing of cement plants in accident prevention is evident.

Each year it seems as if the limit of success had been reached, yet each report shows still further progress. The reports read at the Cement Section of the Sixteenth Annual Safety Congress in Chicago showed that twenty-three plants have gone till September 25 without a lost time accident for 1927.

It will be necessary to buy safety trophies wholesale!

MEN and MILLS

Notes from the Field

Ideal Proceeds with Plans for Arkansas Development

Further plans than those published in these columns in the September issue regarding the White Cliffs, Arkansas, development of the Ideal Portland Cement Company, have now been completed. The operating company will be known as the Arkansas Portland Cement Company.

Two kilns, using the wet process, are to be used. A modern village for the 300 employees is to be built. M. C. Matthews, manager of Ideal, will be in charge of construction of the plant. Work will be done largely by the firm's own engineering and construction forces.

It seems that instead of $3,500,000 as was previously announced, the cost of the plant will be a mere $2,000,000, and have a daily capacity of 2500 barrels.

With its purchase of the controlling interest in the Graysonia, Nashville, and Ashdown Railroad, the company makes connections with the Kansas City Southern, and the Missouri Pacific Railroad. Charles M. Conway, Texarkana, Arkansas, of whom the stock was bought, has retained an interest and will act as the president and general manager of the reorganized road.

J. B. Johns Offers to Buy Michigan State Plant

It seems imminent that the Michigan state cement plant at Chelsea may be sold to J. B. Johns, following a conference between Johns and Governor Green. It was said that Johns is willing to pay an amount equal to what the state has invested in the plant, which the governor recently estimated at $1,000,000. During the previous administration, under Governor Groesbeck, Johns made a similar offer.

The latter is president of the Petoskey Portland Cement Company and vice-president and general manager of the Manitowoc Portland Cement Company.

Since the cancellation of state contracts with producers, several weeks ago, the plant has produced close to capacity. It is possible, it was said recently, that some cement will be purchased outside because of the heavy freight costs to distant road projects.

Seven Per Cent Cumberland Bonds on Market

An investment house is offering a new issue of $450,000 Cumberland Portland Cement Company first mortgage 7 per cent sinking fund convertible gold bonds, dated August 1, 1927, and maturing August 1, 1937. The bonds are being offered at 100 and interest, to yield 7 per cent.

Indiana Second in Cement Manufacture, Survey Shows

A survey made by Mr. T. M. Kinsburry, of the Department of Conservation, Division of Geology of Indiana, shows that Indiana is second only to Pennsylvania in the production of cement and that production is increasing yearly.

American Portland Cement Co. Formed in Los Angeles

The American Portland Cement Company has been organized by a group of Los Angeles men to engage in the manufacture of portland cement and the erection of residences, office buildings, etc. The company has taken over the sole rights for southern California for what is known as the Houghton building construction process.

The company, capitalized at $2,500,000, was organized under the laws of Delaware. Shares of a par value of $1 each are non-assessable and carry no personal liability. The board of directors is composed of Briant S. Young, Max O. Miller and U. J. Rogers. Offices have been established in the Story Building, Los Angeles.

Holdings of the company at the present time consist of 680 acres at Cajon pass, San Bernardino county, where, it is estimated, the company has a superficial area deposit of 22,000,000 tons of lime on the surface, 3,000,000 tons of cement clay on the surface of section 19 and a much greater quantity on section 20.

Glens Falls Plant May Manufacture "Velo"

The Glens Falls Portland Cement Company, Glens Falls, New York, is reported to be considering the manufacture of "Velo" cement in its plant. In a test witnessed by contractors and state highway engineers and made early in August, a block of road two days old was unaffected by the weight of a 14-ton truck.

Velo cement is now a Danish product.

Penn-Dixie Declares New Lower Dividend

A reduction of 30 cents in its quarterly dividend on common stock has been made by the Pennsylvania-Dixie Cement Corporation. The firm recently declared a dividend of 50 cents on common stock, payable October 1 to stock of record September 22. Previous dividends had been 80 cents.

The following statement has been issued by the corporation:

"The outlook at present is that the company for 1927 will earn interest charges, all dividends on the preferred and common stocks, and will carry a reasonable profit to surplus."

The balance sheet as of August 31, 1927, shows cash of over $2,840,000. Current assets were $7,393,670 and current liabilities of $1,601,493, a ratio of more than 4½ to 1.

Former Manager of Atlas Northampton Plant Dies

Henry T. Raisbeck, until recently plant manager of the Northampton, Pennsylvania. plant of the Atlas Portland Cement Company, died August 25th at the Battle Creek Sanitarium, Battle Creek, Michigan. The complications which resulted in death had become aggravated in the past year and necessitated Mr. Raisbeck's resignation from his position last May after 30 years' service.

His condition became serious three weeks before his death and on August 15th he went to the Battle Creek institution for relief.

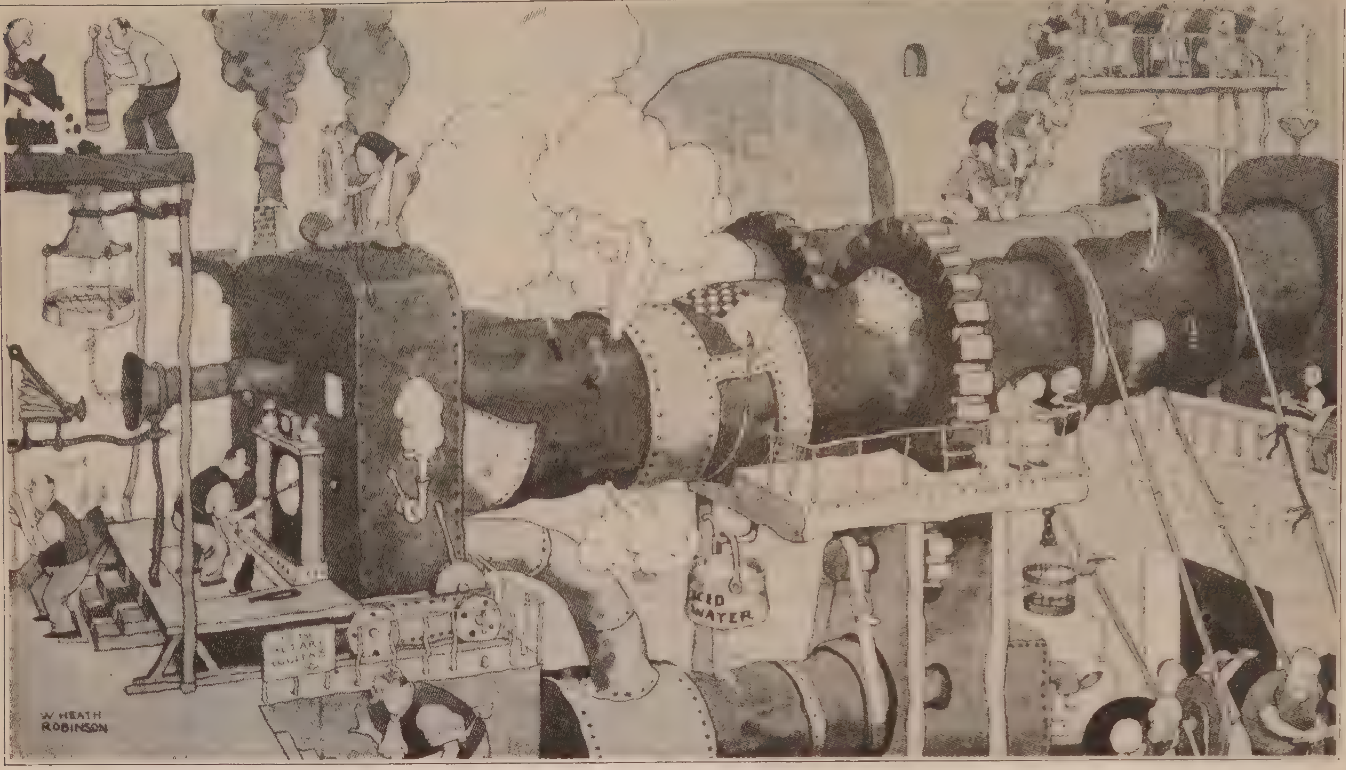
Previous to becoming plant manager, Mr. Raisbeck had been chief engineer of the plant.

Vulcanite Begins Manufacture of Super Cement

On October 1st the Vulcanite Portland Cement Company began the initial manufacture of Super Cement at its plant at Vulcanite, Warren County, New Jersey.

Chairman of Marquette Board Dies

The death of Nicholas W. Duncan, chairman of the Board of Directors of the Marquette Cement Manufacturing Company, occurred Sunday, August 28th. Mr. Duncan was 71 years of age.



A kiln in "the world's most modern, up-to-date cement plant." It might not be a bad idea to get a few more blankets and some tin to patch the kiln. This is another of a series of advertisements for G. & T. Earle, Ltd., appearing in an English builders' magazine

Newhouse Returns to Allis-Chalmers

R. C. Newhouse, for the past year and a half vice-president and manager of the Cowham Engineering Company, Chicago, has again taken his former position as chief engineer of the crushing and cement machinery department of the Allis-Chalmers Company, Milwaukee.

Mr. Newhouse has been connected with Allis-Chalmers from 1905 until 1926, when he joined the Cowham company.

Marquette Entertains Board of Improvements

The board of local improvements of Rock Falls, Illinois, was the guest of the Marquette Cement Manufacturing Company at LaSalle, Illinois, on August 17th.

Engineer Preparing for Monolith Plant in Wyoming

H. E. Christian, representing the MacDonald Engineering Company, Chicago, is in Laramie, Wyoming, where he will superintend the erection of the $2,000,000 plant for the Monolith Midwest Portland Cement Company. The plant will have a capacity of 2,000 to 6,000 barrels a day, and is expected to be in operation before the summer of 1928.

Stone nearby is said to contain 85 per cent pure lime.

Cement Plant Executive's Home Is Dynamited

The country home of John H. Soell, secretary of the Missouri Portland Cement Company, was dynamited on Sunday, September 4th, by two young St. Louisians who had worked on the nearly completed building. The home is near St. James, in St. Louis County. The dynamite had been placed in the hot water heating furnace following a quarrel between a watchman and the workers. Windows were blown out and walls damaged. Bloodhounds traced the culprits, one of whom was jailed and the other freed on bond.

Atlas Transfers J. H. Bell to Pacific Coast

J. H. Bell has been appointed Pacific coast representative of the Atlas Portland Cement Company, New York. He will have his headquarters in Los Angeles with office at 507 Edwards and Widely Building. R. H. Campbell, formerly representing Atlas on the west coast, has been transferred to New York in charge of the white cement department.

One of First Atlas Employes Dies

Amandus J. Miller, one of the first employes of the Atlas Portland Cement Company, at Northampton, Pa., died recently at his home at Coplay of pneumonia. He was 61 years old.

Penn-Dixie Holds Barbecue For Workers

The Pennsylvania-Dixie Cement Corporation was the host Sunday, September 11th, to workers in the Pennsylvania, Penn-Allen and Dexter plants. A southern barbecue was held at the Nazareth fair grounds.

Morris Fortuin On Way to Recovery After Operation

Morris Fortuin, general manager of the Penn-Dixie Cement Corporation at Nazareth, is reported to be improving satisfactorily after being operated on for a serious case of appendicitis on Sunday, September 4. The operation was performed at the Easton Hospital, Easton, Pa.

Action on Accountant's Bill for Chelsea Plant Deferred

Following criticism by Gov. Fred W. Green of Michigan, of the appraisal of the Chelsea cement plant by Coats and Burchard, Chicago, accountants, the state administrative board has deferred action on a bill for $3,340.

Because the finance committee believed that the state was morally obligated, it approved the audit. It was the governor's opinion that "any audit which showed a junk locomotive engine to be worth $117,000 is not worth $3,300."

A committee will confer with representatives of the firm.

British Cement Interests Form Combine to Improve Concrete Construction

An industrial combination of far-reaching importance has just been formed in the United Kingdom, aiming at the building of better roads and more houses, by the linking up of three of the big British cement producers and their associated companies. The quick transport of cement to any part of Great Britain will be facilitated, as the works are located in the north, the midlands and the south, on main railway lines, ship canals and roads.

The three principal undertakings concerned are the Ship Canal Portland Cement Manufacturers, Ltd., the Holborough Cement Co., Ltd., and Greaves, Bull & Lakin, Ltd.

The Ship Canal Co., which has an issued capital of £330,175 ($1,650,875) and £600,000 ($3,000,000) in 6½ per cent debenture stock, has its own deep water wharf on the Manchester ship canal, in addition to direct access to the Shropshire Union canal. The works at Ellesmere Port, Cheshire, have private sidings to the London, Midland & Scottish and the Great Western railways.

The Holborough Cement Co. has an issued share capital of £450,000 ($2,250,000). Its mills are at Snodland, Kent, on an estate of 265 acres, containing 20,000,000 tons of marl in the subsoil. The present annual output of the works, which continues its milling day and night throughout the year, is 200,000 tons of finished cement. The Holborough Works, which are on the Southern Railway and an arterial road, have a 618-foot frontage on the River Medway with a wharf and are within six miles of Rochester, which accommodates ocean-going vessels of 5,000 tons.

The Midland Works are those of Greaves, Bull & Lakin—a firm over a hundred years old, with an authorized capital of £475,000 ($2,375,000), and works covering 800 acres. Another member of the combine is the British Cement Products & Finance Co., which was floated at the end of last year, and has issued capital of £105,000 ($525,000).

For these four amalgamating firms the Portland Cement Selling & Distributing Co. has been formed to act as a selling and distributing agency with a capital of £250,000 ($1,250,000).

Engineers' Society Guest of Universal

Members of the Western Society of Engineers were the guests of the Universal Portland Cement Company on August 17th, when a steamer transported them over Lake Michigan to Buffington Harbor and the cement plant there. Upon arrival, a standard freighter of the Pittsburgh Steamship Company was unloaded by a traveling bridge carrying a trolley and a 10-ton bucket.

After inspecting the harbor and boats, the party was conducted through the plant. Moving pictures of the harbor, boats, and of the plant were shown on board ship.

Governor Asks Impartiality for State Plant

That Michigan's state cement plant at Chelsea will be shown no partiality was declared by Governor Fred W. Green recently, in a statement instructing the Chelsea plant to submit bids on all jobs within its territory. According to Governor Green, if the plant is not the lowest bidder on a job, it will not be given the contract.

Atlas Chemist Dies; One of Oldest Employes

Robert Clewell, one of the first employes at the Northampton, Pennsylvania, plant of the Atlas Portland Cement Company died recently at his home. He had been employed as a chemist at the plant since its establishment.

Invite City Commissioner to Address Safety Group

The Bellevue Portland Cement Company, at Bellevue, Michigan, has invited Wm. Penty, city commissioner of Battle Creek and Frank Smoke, of the Kellogg Company, to speak before the safety committee workers soon.

These two men have helped to establish a remarkable record at the Kellogg plant and their ideas are sought.

Monolith Continues to Find Natural Gas as Kiln Fuel Successful

The installation whereby its rotary kilns are now fueled and fired with natural gas instead of oil is continuing successfully according to the Monolith Portland Cement Company of Monolith, California. The company's plant is located 117 miles north of Los Angeles, at Monolith Station, on the Tehachapi Pass.

Gas is conducted to the plant from the Rose Station of the Midway Gas Company, near Bakersfield, through an 8-inch line, 37 miles in length, delivering it into an 18-inch header, or receiver, at 10 pounds pressure. It is fed from the header to the four kilns through 8-inch feeder pipes under a pressure of 6.5 pounds per square inch at the burners.

A comparison of fuel costs when the kilns were oil fired with those at present under natural gas operation shows an economy in the use of gas, it is reported.

Charge New Rates Favor Yosemite Plant

Complaints against a new schedule of rates applicable from the plant of the Yosemite Portland Cement Company, near Merced, were heard recently by the California State Railroad Commission.

The protests were made by plants in northern and central California, located at the Cowell, San Juan, Davenport and North Branch stations, on the ground that the new rates favor Yosemite and are prejudicial to the complainants.

Signal Mountain Bonds on Market

A St. Paul, Minnesota, house is offering $600,000 Signal Mountain Portland Cement Company five-year sinking fund gold notes, dated August 1, 1927. The authorized issue is $1,000,000.

Former Stockholder Sues Hermitage

A suit has been begun in Hamilton County, Tennessee, by R. T. Miller against John C. Vance for $8,639.13 in common stock of the Hermitage Portland Cement Company, Nashville.

A partnership was formed prior to January, 1925, by Mr. Miller, John C. Vance and Charles L. Hall, now deceased.

Mr. Miller claims in his bill that the contract of the firm with the corporation was that for their services in the organization they were to receive 5 per cent of the cost price of the plant when finished, in preferred stock, which was issued when the plant was completed. The shares divided between the partners totaled 3,666. During February, 1925, the bill continues, Mr. Miller was notified by the bookkeeper that the books were out of balance with reference to the issuance of the common stock and that there had been an over-issue of 248⅜ shares. Mr. Miller then surrendered his 1,222 shares, for which he received a certificate for 973⅝ shares, which balanced the books and corrected the over-issue. Restitution is said never to have been made.

The death of Charles L. Hall came shortly after, followed by the establishment of the insolvency of his estate.

Mr. Miller now claims that Vance is liable to him for one-half of the common stock, to the sum of $8,639.13, together with interest.

Chemist Regains Health

Lewis Eisenhard, chemist at the Lawrence Portland Cement Company plant, Lehigh County, Pennsylvania, recently returned from Battle Creek, Michigan, where he resided for some time in an effort to regain his health. An operation performed during that period brought considerable improvement after a baffling illness.

Cement Statistics for August

THE recurrent summer rise carried the curves of production and shipments of portland cement to new peaks in August, according to the Bureau of Mines, Department of Commerce. Production shows an increase of nearly 8 per cent; shipments an increase of over 15 per cent over the corresponding period in 1926. Portland cement stocks are still declining but are nearly 4 per cent in excess of the stocks at the end of August, 1926.

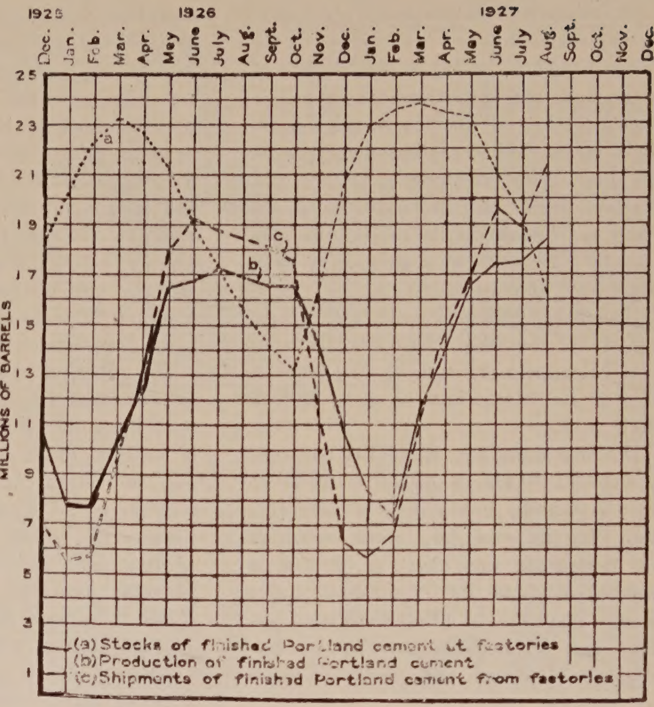
The output of another new plant, located in Pennsylvania, is included in these statistics.

Estimated Clinker (Unground Cement) at the Mills at End of Each Month, 1926 and 1927

(Figures Represent Thousands of Barrels)

Month	1926	1927
January	9,074	9,989
February	10,931	11,943
March	12,290	12,997
April	12,967	13,335
May	11,695	*12,514
June	10,144	*10,926
July	8,604	*9,609
August	7,362	7,909
September	6,112	....
October	5,370	....
November	5,748	....
December	7,799	....

*Revised.



Production, Shipments and Stocks of Finished Portland Cement, by Months and by Districts, in Barrels

Month	Production 1926	Production 1927	Shipments 1926	Shipments 1927	Stocks at end of month 1926	Stocks at end of month 1927
January	7,887,000	8,258,000	5,674,000	5,968,000	20,582,000	22,914,000
February	7,731,000	7,377,000	5,820,000	6,731,000	22,385,000	23,560,000
March	10,390,000	11,452,000	9,539,000	11,083,000	23,236,000	23,922,000
First quarter	26,008,000	27,087,000	21,033,000	23,782,000	....	....
April	12,440,000	14,048,000	12,965,000	14,350,000	22,710,000	23,654,000
May	16,510,000	*16,701,000	17,973,000	*16,865,000	21,255,000	*23,503,000
June	16,866,000	*17,224,000	19,134,000	*19,761,000	19,000,000	*20,972,000
Second quarter	45,816,000	*47,973,000	50,072,000	*50,976,000	....	....
July	17,134,000	17,398,000	18,812,000	18,984,000	17,301,000	*19,397,000
August	16,995,000	18,305,000	18,583,000	21,411,000	15,718,000	16,290,000
September	16,571,000	....	18,087,000	....	14,188,000	....
Third quarter	50,700,000	....	55,482,000	....	....	....
October	16,596,000	....	17,486,000	....	13,334,000	....
November	14,193,000	....	11,276,000	....	16,243,000	....
December	10,744,000	....	6,432,000	....	20,616,000	....
Fourth quarter	41,533,000	....	35,194,000	....	....	....
	164,057,000	....	161,781,000	....	....	....

*Revised.

Commercial District	Production—August— 1926	Production—August— 1927	Shipments—August— 1926	Shipments—August— 1927	Stocks at end of August 1926	Stocks at end of August 1927	Stocks at end of July, 1927*
Eastern Pennsylvania, New Jersey, Md.	3,901,000	4,245,000	4,212,000	4,484,000	3,375,000	4,007,000	4,247,000
New York	936,000	1,348,000	1,086,000	1,514,000	842,000	1,365,000	1,531,000
Ohio, Western Penn., and West Virginia	*1,824,000	1,967,000	*1,897,000	2,489,000	2,036,000	2,284,000	2,806,000
Michigan	1,508,000	1,661,000	1,806,000	2,146,000	1,261,000	1,257,000	1,743,000
Wisconsin, Illinois, Indiana, and Kentucky	*2,414,000	2,492,000	*2,889,000	3,119,000	1,925,000	1,231,000	1,857,000
Virginia, Tennessee, Ala., Ga., and La.†	1,366,000	1,522,000	1,427,000	1,628,000	1,089,000	1,145,000	1,251,000
Eastern Missouri, Iowa, Minn., and So. Dak.	1,561,000	1,585,000	1,720,000	2,267,000	2,078,000	1,737,000	2,419,000
West. Missouri, Nebraska, Kan., and Okla.	1,162,000	943,000	1,192,000	1,149,000	1,331,000	1,466,000	1,672,000
Texas	440,000	496,000	494,000	561,000	418,000	251,000	316,000
Colorado, Montana, and Utah	309,000	216,000	297,000	293,000	425,000	454,000	531,000
California	1,248,000	1,399,000	1,258,000	1,306,000	504,000	717,000	624,000
Oregon and Washington	326,000	431,000	305,000	455,000	434,000	376,000	400,000
	16,995,000	18,305,000	18,583,000	21,411,000	15,718,000	16,290,000	19,397,000

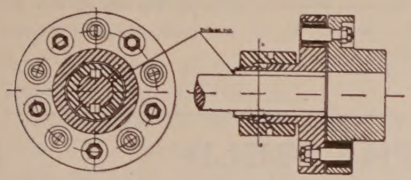
*Revised. †Began producing June, 1927, and shipping July, 1927.

Mill Equipment

A Flexible Coupling That is Easily Removable

A new flexible coupling, a modification of the standard Ajax rubber bumper coupling, is made so that the flange attached to the driven shaft is readily removable. The removable half is made with an extended split hub on the driving flange, the hub being tapered on the outside, and threaded over one half its length, closest the flange. A collar—made to fit over the threaded hub—screws up to a tension fit, tightening the hub to the shaft, being further held in place by set screws, fitted over two sliding keys.

This type of coupling can be connected or disconnected in a very few minutes, the only tools required being a pipe and set screw wrench. The removable flange and collar are made of steel, all other parts being identical to standard Ajax couplings, and so interchangeable in case of accidental breakage.



The Ajax Flexible Coupling Company, Westfield, New York, is the manufacturer.

Tile Corrects Faults of Furnace Construction

A material economy in the maintenance and a substantial lengthening of the life of furnace walls is effected by Reintjes Flexible Corner Bonding Tile. This tile eliminates common faults of corner construction and effects perfect bonding in both side and end wall.

Reintjes Flexible Corner Bonding Tile provides ample clearance for expansion at the corners. It also ties together the side and end walls, preventing the front wall falling inward.

Reintjes Flexible Bonding Tile can be placed in the side wall at intervals to take care of expansion needs. The expansion joint is provided either by parting of the tile, or clipping with trowel the end of one tile.

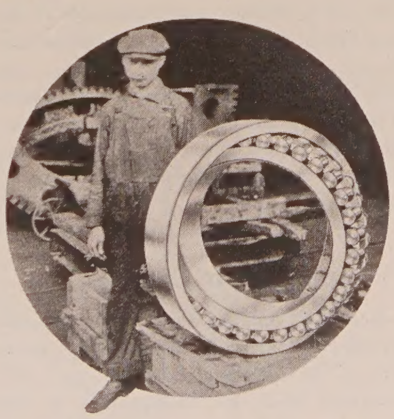
The Reintjes Flexible Corner Bonding Tile is the thickness of one course of brick and serves as a starting brick for each course. The joints break at each succeeding course and form a perfect corner of the inner nine-inch refractory lining. The tile in each course overlaps the next lower course, further strengthening the structure. The tile is developed for use when the brick are set in the solid header or quarter bond patterns. Two corner bonding tiles displace three brick and one soap.

The Geo. P. Reintjes Company, 2517-19 Jefferson Street, Kansas City, Missouri, is the manufacturer.

Self-Aligning Roller Bearings Running Successfully for Three Years

Two huge S. K. F. Spherical Bearings, said to be the largest of their kind in actual service have been successfully operating for a period of over three years in a "cylpeb" cement mill at the plant of the Dexter Portland Cement Company, Nazareth, Pennsylvania. These bearings, almost three feet in diameter, are carrying the load of a 5½ by 26 foot tube mill used in pulverizing. The mill is driven by a 250 H. P. motor at a speed of 26 R. P. M. The load is 50 tons or 25 tons per bearing.

During the three-year period, these bearings have been on the job continuously and, the only attention required has been replenishing of lubricant several times a year. In addition to carrying heavy thrust and radial loads, an important feature of these bearings has been their self-aligning characteristics. Any inaccuracies in setting up and settling of foundation are compensated for within the bearings without the need of any external aligning devices or the setting up of internal strains or stresses.



They are a product of the S. K. F. Industries, Inc., New York City.

A New Design of Takeup by Link-Belt

The Link-Belt Company, 300 West Pershing Road, Chicago, announce an improved design, "Protected Screw" type takeup for heavy work and long-movement, to be known as Style "DS."

Frame is of welded structural steel with channel base welded to ends formed of steel plates, bent and welded into strong box members, in which the adjusting screw is mounted.

The steel angle bolted on top of ends protects the screw from dirt or the weather, in addition to tying the ends together, strengthening the frame and preventing upward movement of bearing.

The protected screw remains fixed in position, and the nut for adjusting the movement of bearing travels on the screw.

The movement-adjusting screw does not project beyond ends of frame, or require additional space and special framing.

The rugged cast iron bearing is lined with high grade of babbitt, tapped for grease cup or pressure fitting, and is correctly proportioned in length for each diameter of shaft.

American Electric Hoist

The manufacture of a new Lo-Hed electric hoist that can be mounted in a fixed position, either overhead or on the ground, or can be placed on skids and used as a portable hoist, has been inaugurated by the American Engineering Company, of Philadelphia.

The drum has large flanges which prevent the rope jumping the ends and give maximum stowage capacity. One bearing of the drum shaft is lubricated by splash from the gears and the other by an Alemite fitting.

G-E Dust-Tight Cases for Starters

Cases for wall-mounted, general purpose starters have been perfected by the General Electric Company, Schenectady, New York. The cases are dust-tight and constructed of ¼-inch boiler plate steel with welded joints.

The front is covered by a boiler-plate door which swings on interchangeable hinges, opening to the right or to the left. Conduit leads are provided for bringing leads to the case.

With the Manufacturers

INDUSTRIAL LITERATURE

Traylor Roll Bulletin

Traylor heavy duty crushing rolls are described in *Bulletin 2106*, recently published by the *Traylor Engineering and Manufacturing Company*, Allentown, Pennsylvania. This supersedes *Bulletin 1106*, and gives all desired information.

General Electric Leaflets

Literature published recently by the *General Electric Company*, Schenectady, New York, includes a loose leaflet on "Semi-automatic Reduced Voltage Starters for Synchronous Motors," and one on a "CR 7006-D20 Magnetic Switch."

S-A Publication

A special issue of *"The Labor Saver"* was published recently by the *Stephens-Adamson Company*, Aurora, Illinois. A descriptive index lists the contents.

Portland Cement and Fire Brick

The June bulletin of *Laclede-Christy*, St. Louis, Mo., devotes some space to the refractory needs of the portland cement industry, as well as illustrations of parts of plants.

Coal Carbonization Booklet

The K. S. G. process for the low-temperature carbonization of coal, developed in Europe, is the subject of *Publication IC-3*, published by the *International Combustion Engineering Corporation*, New York, N. Y.

New Book

"History of the Explosives Industry in America"

"The History of the Explosives Industry in America" is the fruit of researches into the history of explosives, with its ramifications, made by two men for three years. It was written by Arthur Pine Van Gelder and Hugo Schlatter, explosives chemists, and published by the Columbia University Press, New York, under the auspices of the Institute of Makers of Explosives.

The contents of the book's 1152 pages and 500 illustrations make it a most authoritative history of explosives in the United States.

Rex Catalog

The newly published *Chain Belt Company* catalog on *Rex* chains and transmission equipment, supplementing No. 210, contains latest list prices, and descriptions of new types of chain. A detailed description and possible uses of each type and essential data for ordering are also included.

Speed Reducer Catalog

The Huron speed reducer, a product of the *Huron Industries, Inc.*, Alpena, Michigan, and a part of *"the Huron Line,"* is cataloged in a comprehensive booklet containing diagrams, horsepower tables, and illustrations. Seal rings for rotary kilns and dryers are completely described in another similar publication.

Speed Reducer Booklet

Book 715, published by the *Link-Belt Company*, features the *Sykes Herringbone* speed reducer, "the reducer with a backbone." Horsepower tables, diagrams, specifications, and numerous views give all details.

Scraper System Catalog

The R. H. Beaumont Company, Philadelphia, Pa., recently issued *Catalog No. 95*, devoted to the *Beaumont Cable Drag Scraper System* for handling bulk materials. *Beaumont Bin Gates* and the newly acquired *American Slack Line Cableway* are also shown.

Chain Catalog

The Webster Manufacturing Company, Chicago, Illinois, *Catalog No. 50*, is now off the press. It is devoted to chains and sprockets.

NOTES FROM THE FIELD

Cutler-Hammer Branch

The Cleveland office of the *Cutler-Hammer Manufacturing Company*, Milwaukee, Wisconsin, has been moved from the Guardian Trust Building to the Guarantee Title Building. This new location gives the office approximately three times as much space as it had formerly.

Works Manager Promoted

Mr. R. L. Wilson, works manager of the East Pittsburgh plant of the *Westinghouse Electric and Manufacturing Company*, has been appointed to the position of assistant to the vice president and general manager. Mr. J. M. Hipple, formerly manager of the company's motor engineering department, succeeds him.

Link-Belt Changes

Mr. R. P. Shimmin has been appointed assistant to the chairman and the president of the *Link-Belt Company*, and will, hereafter, make his headquarters at 910 S. Michigan Ave.

Frank B. Caldwell has been appointed sales manager with headquarters at the Chicago plant office, 300 W. Pershing Road, and will have supervision over all sales activities in the western division.

Chain Belt Superintendent

Luther H. Bosnian has been appointed superintendent of the Park Street plant of the *Chain Belt Company*, Milwaukee. *Mr. Bosnian* is a graduate of the Sheffield Scientific School, Yale University, and has been connected with the *Chain Belt Company's* Production Department for the past eight years.

Previous to this he was with the Westinghouse Electric and Manufacturing Company and came to the *Chain Belt Company* in 1919 as a time study man.

Foster Wheeler Corporation

The assets, plans, and the engineering, research, sales departments and subsidiaries of the *Power Specialty Company* and the *Wheeler Condenser and Engineering Company* have been consolidated and are now assembled under one corporate, to be known as the *Foster Wheeler Corporation*, New York City.

Foote Distributors

Hollis and Company, 305-11 East Markham Street, Little Rock, Arkansas, have been appointed distributors for the city of Little Rock and vicinity for the *Foote Bros. Gear & Machine Co.*